



VIRTUAL IMPACT: LEVERAGING CITIZEN AIRMEN'S
COMPLEMENTARY SKILLS FOR INCREASED CYBER MISSION
EFFECTIVENESS

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A THESIS PRESENTED TO THE FACULTY OF
THE SCHOOL OF ADVANCED AIR AND SPACE STUDIES
FOR COMPLETION OF GRADUATION REQUIREMENTS

SCHOOL OF ADVANCED AIR AND SPACE STUDIES
AIR UNIVERSITY
MAXWELL AIR FORCE BASE, ALABAMA
MAY 2013

Report Documentation Page			<i>Form Approved OMB No. 0704-0188</i>	
<p>Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.</p>				
1. REPORT DATE MAY 2013	2. REPORT TYPE	3. DATES COVERED 00-00-2013 to 00-00-2013		
4. TITLE AND SUBTITLE Virtual Impact: Leveraging Citizen Airmen's Complementary Skills For Increased Cyber Mission Effectiveness				
5a. CONTRACT NUMBER				
5b. GRANT NUMBER				
5c. PROGRAM ELEMENT NUMBER				
6. AUTHOR(S)				
5d. PROJECT NUMBER				
5e. TASK NUMBER				
5f. WORK UNIT NUMBER				
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) School Of Advanced Air And Space Studies,,Air University,,Maxwell Air Force Base,,AL				
8. PERFORMING ORGANIZATION REPORT NUMBER				
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				
10. SPONSOR/MONITOR'S ACRONYM(S)				
11. SPONSOR/MONITOR'S REPORT NUMBER(S)				
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution unlimited				
13. SUPPLEMENTARY NOTES				
14. ABSTRACT Citizen soldiers, from the warriors in the early colonial militia to today's Guard and Reserve Airmen, have a distinguished tradition of service to the nation. In addition to traditional combat arms and combat support roles, today's part-time Airmen have unique skills and experience to leverage during their uniformed service. The fundamental research question in this study is "How should the AF best leverage the part-time Citizen Airmen's civilian expertise to contribute to the USAF cyber mission? There are opportunities to increase cyber mission effectiveness by selectively leveraging the expertise some Airmen gain and use during their civilian employment.				
15. SUBJECT TERMS				
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT Same as Report (SAR)	
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified	18. NUMBER OF PAGES 77	19a. NAME OF RESPONSIBLE PERSON

APPROVAL

The undersigned certify that this thesis meets master's-level standards of research, argumentation, and expression.

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DISCLAIMER

The conclusions and opinions expressed in this document are those of the author. They do not reflect the official position of the US Government, Department of Defense, the United States Air Force, or Air University.

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ACKNOWLEDGEMENTS

A work of this magnitude is never the product of just one person's efforts. I would first like to thank my advisor, Col(s) Rick Bailey, Jr., for helping me complete this journey-- I am grateful for his mentoring. I would like to thank my reader, Dr. Richard Muller, for his critical analysis and assistance in clarifying my prose, Dr. Kevin Holzimer, for shaping my understanding of the militia and history of military policy, and Col Stephen Hagel (ret), for his door always being open. I owe a debt of gratitude to the SAASS faculty and the other Deuces.

I would be remiss if I did not extend thanks to Maj Gen Richard Haddad, Col William Redmond (ret) and Col Bart Gray for their insights early in this research process. Thanks to Sandy Malladi, Mark Nelson, Sylvester Jackson, and the staffs at the Air University Library, Air Force Historical Research Agency and Air Force Reserve Command History Office for their invaluable assistance.

Lastly, I want to remember and honor my father and mother. A heart-felt thanks is the least I can offer my family and friends who encouraged me and prayed for me during this rewarding year. To my godson, nieces and nephews, I am now ready to play.

ABSTRACT

Citizen soldiers, from the warriors in the early colonial militia to today's Guard and Reserve Airmen, have a distinguished tradition of service to the nation. In addition to traditional combat arms and combat support roles, today's part-time Airmen have unique skills and experience to leverage during their uniformed service. The fundamental research question in this study is – How should the AF best leverage the part-time Citizen Airmen's civilian expertise to contribute to the USAF cyber mission? There are opportunities to increase cyber mission effectiveness by selectively leveraging the expertise some Airmen gain and use during their civilian employment.

This thesis addresses the question through use of the historical analogy approach with two examples – the Office of Strategic Services (OSS) and the Civil Reserve Air Fleet (CRAF). They were two distinct solutions the USG created to address gaps in its active component (AC) forces. During its short, nearly four-year existence from 1941 until 1945, the Coordinator of Information (COI) and OSS were the USG's first formal civilian organization and military unit, respectively, authorized to accomplish sabotage and centralized intelligence. The CRAF program is a contract that enables the USAF to meet some of its wartime and peacetime airlift requirements through US commercial carrier capabilities. When the Joint Chiefs of Staff (JCS) worked with the President to make the OSS a direct reporting agency, they gained capabilities complementing those of conventional Army units. For over sixty years the CRAF program continues to provide a capability that satisfies the DOD's surge airlift requirements and simultaneously provides acceptable profit to compensate for the assumed risk.

The ARC's contribution to the cyber enterprise is analyzed through the lenses of culture, cost, and risk. As each of the three key variables is discussed, the relevant examples from the two historical analogies are highlighted and applied. Given the breadth of ongoing policy initiatives including pay and benefits, operational force, and force mix, the analysis focuses on data relevant for the specific recommendations.

As opposed to the Militia Acts of 1792 & 1903, and the Total Force Policies (which required major legislative or regulatory overhauls) the three primary recommendations addressed in this research can be implemented by AFRC and ANG leadership. Each of the three recommendations can be implemented at a different level (ARC, unit and individual). First, the DOD needs to clarify its policy for the Reserve Component (RC) role in the CONUS-based cyberspace mission and fund it appropriately. This recommendation acknowledges that the CONUS cyber mission is unique compared to the typical deployed combat and combat support missions. Second, the ARC should create elite teams that supported combatant commands (CCMDs) and Homeland Defense/Civil Support (HDCS) units can use to experiment with organizational response approaches. Third, ARC Airmen should utilize virtual teaming (VT) and telecommuting to contribute to the fight regardless of geographic limitations. These recommendations are intended to build upon the existing and planned direction for many units within the ARC cyber enterprise.

Table of Contents

Chapter		Page
	DISCLAIMER.....	ii
	ABOUT THE AUTHOR.....	iii
	ACKNOWLEDGEMENTS.....	iv
	ABSTRACT.....	v
1	THE LEVERAGE PUZZLE.....	1
2	PART-TIME BYTES: THE CYBER DILEMMA AND THE AMERICAN MILITIA.....	5
3	OFFICE OF STRATEGIC SERVICES	21
4	CIVIL RESERVE AIR FLEET	29
5	ANALYSIS	38
6	RECOMMENDATIONS	54
7	CONCLUSION.....	60
	BIBLIOGRAPHY.....	64

Chapter 1

The Leverage Puzzle

There is a greater likelihood that poor strategy will cause the over-throw of nations than poor tactics. . . . The failure of England and France to prevent the creation of that German air force, or to build more powerful air forces of their own, were examples of defective strategy.

H. H. Arnold and Ira C. Eaker

This thesis will contribute to ongoing discussions regarding how the United States Air Force (USAF) should leverage the distinctive skills of its Air Reserve Component (ARC) members in the cyber enterprise. As the USAF and United States Government (USG) at large continue to define and execute their responsibilities in the cyber domain, existing assumptions and paradigms need to be evaluated. This thesis will explore the significance of enhancing an Air Force culture that capitalizes on civilian skill sets of citizen Airmen within the cyber enterprise while acknowledging existing structural limitations and traditions. The differences between the physical warfighting domain and the cyber domain offer a unique opportunity for the members of the Guard and Reserve to fuse their civilian competencies with military fundamentals.

Therefore, the fundamental research question for this study is – How should the AF best leverage the part-time Citizen Airmen’s civilian expertise to contribute to the USAF cyber mission?

Methodology

The selected historical analogy approach to research enables an analysis of previous events to inform future decisions. According to Yuen Khong, a historical analogy “signifies an inference that if two or more events separated in time agree in one respect, then they may also agree in another.”¹ Prolific science fiction writer Arthur C. Clarke warned, “It is impossible to predict the future, and all attempts to do so in any detail appear ludicrous within a few years. Therefore, one should not try to describe the future, but to define the boundaries within which possible futures must lie.”² Twenty years later the esteemed historian Sir Michael Howard wrote, “I do not myself believe in any simple ‘lessons of history’, and I have learned to mistrust

¹ Yuen Foong Khong, *Analogy at War: Korea, Munich, Dien Bien Phu, and the Vietnam Decisions of 1965* (Princeton, N.J: Princeton University Press, 1992), 6–7.

² Arthur C. Clarke, *Profiles of the Future : an Inquiry into the Limits of the Possible*, (New York: New York, Harper & Row, 1973), 1.

historical analogy as a lazy substitute for analytic thought.”³ In 1985, William H. McNeil wrote in a commissioned essay entitled “Why Study History?” that:

First, the study of history does not lead to exact prediction of future events. Though it fosters practical wisdom, knowledge of the past does not permit anyone to know exactly what is going to happen. Looking at some selected segment from the past in order to find out what will occur “next time” can mislead the unwary, simply because the complex setting within which human beings act is never twice the same. Consequently, the lessons of history, though supremely valuable when wisely formulated, become grossly misleading when oversimplifiers try to transfer them mechanically from one age to another or from one place to another. Anyone who claims to perform such a feat is sadly self-deceived. Practical wisdom requires us instead to expect differences as well as similarities, changes as well as continuities-always and everywhere.⁴

This work endeavors to heed and overcome these warnings to create a small but well-constructed contribution in keeping with the following two recommendations. Scot MacDonald wrote that “historical analogies are a rational means of retrieving information from history, simplifying and organizing current information, and prescribing and justifying policy. Historical analogies also provide information about the stakes, adversaries, allies, time, risks and policy options. Without historical analogies, every foreign policy crisis would appear to be unique.”⁵ Robert Jervis wrote that “previous international events provide the statesman with a range of imaginable situations and allow him to detect patterns and causal links that can help in understanding his world.”⁶ Thus, this research will apply lessons learned from previous experiences, combined with a realistic understanding of the unique challenges of the present cyber enterprise, to present thoughtful possibilities for approachable solutions.

Definitions

Given the ongoing debates regarding cyberspace, the argument of this thesis is intentionally independent of precisely defining terms such as cyber, cyberspace and cyberpower, and acknowledgement of the existence of the cyber domain. The continuing debate whether cyber is a domain is not germane; this thesis addresses how the Reserve Component (RC) can

³ Michael Howard, *The Causes of Wars and Other Essays*, 2nd ed., e (Cambridge, Mass: Harvard University Press, 1984), 132. Despite his misgiving, this thesis attempts to combine analytic rigor with the historical analogy process.

⁴ William H. McNeil, “Why Study History,” 1985.

⁵ Quoted in John B Sheldon, “Reasoning by Strategic Analogy: Classical Strategic Thought and the Foundations of a Theory of Space Power” (2005): 19.

⁶ Robert Jervis, *Perception and Misperception in International Politics* (Princeton, N.J: Princeton University Press, 1976), 217.

leverage the skills of its Airmen to contribute to the cyber mission, not whether it should be involved. While definitions are important, this thesis contributes to improving planning and on-going operations. More precise agreement on definitions will be increasingly important as specific implementation policies and plans are created and executed. In the interim, however, several key terms will be defined since a shared meaning will aid communication.

The current DOD definition of cyberspace is “a global domain within the information environment consisting of the interdependent network of information technology infrastructures, including the Internet, telecommunications networks, computer systems, and embedded processors and controllers.”⁷ One of RAND’s cyberspace experts, Martin Libicki, describes cyberspace as having three layers: physical, syntactic, and semantic. The physical layer is composed of tangible items (infrastructure such as wires, switches and routers). The “semantic layer contains the information meaningful to humans or connected devices (for example, machine tools).” The syntactic layer, therefore, bridges the gap between these two and concerns the coding, ordering and distribution of information.⁸

The operators and contributors to the cyber mission set include Airmen in engineering, intelligence, Judge Advocate General (JAG) and paralegal specialties in addition to cyberspace officers and enlisted Air Force Specialty Codes (AFSCs).⁹ While the Air Force (AF) tends to focus on the technical engineering capabilities, long-term success will require understanding and integration with the semantic level, the human environment. The interdisciplinary community must include influential participants with sociocultural expertise.¹⁰ The argument of this thesis is

⁷ DOD Dictionary, http://www.dtic.mil/doctrine/dod_dictionary/data/c10160.html (accessed February 23, 2013)

⁸ Martin C Libicki, *Conquest in Cyberspace: National Security and Information Warfare* (Cambridge University Press, 2007), 8–9.

⁹ The Air Force uses Air Force Specialty Codes (AFSCs) as a management tool to capture the education, training and experience Airmen have. The cyber career field includes officer and enlisted AFSCs and the qualified civilians, based on the Office of Personnel Management (OPM) skill code equivalent to the AFSCs. The officer classification is cyber operations officer (AFSC 17D) with two shreds, and the Communications officer (AFSC 33S) with one shred for Engineer. The enlisted classifications are Cyberspace Defense (1 AFSC in 1B is 1B4X1), and Cyberspace Support (11 distinct AFSCs in 3D). Special Experience Identifiers (SEIs) are used to identify special experience and training. The AF personnel system of record MILPIDS stores the AFSC and SEI information along with other information about all its current Airmen, AC and RC. Based on the experience of a given officer, officers in the following AFSC billets could contribute to the cyber mission set: 14N (Intelligence), 51J (Judge Advocate, lawyers), 62 (Developmental Engineer), 63 (Acquisition Manager) and 71S (Special Investigator). The related enlisted AFSCs, based on the experience of a given enlisted personnel, P (Paralegal), 7S (Special Investigations). (Air Force Officer Classification Directory(AFOCD)).

¹⁰ John et al Shanahan, “Operational Relevance of Behavioral & Social Science to DoD Missions,” March 2013, 14–15.

independent of the inclusion or exclusion of psychological operations, military deception, and public affairs, yet their contributions are essential in Libicki's semantic layer.^{11,12}

This research asserts that augmentation and complementing are the two categories of ways the RC can support the active component (AC). Augmentation refers to an ARC member or Unit Type Code (UTC) providing more of the same type of capability resident in the AC.¹³ Complementing refers to the ARC providing capabilities that for a variety of reasons are not available in the AC.

Assumptions

This thesis only references unclassified sources, which severely limits the discussion of cyber operations and the particular skills required. This thesis focuses on the portion of the cyber mission set that can be accomplished in the Continental United States (CONUS) and other non-deployed locations.¹⁴

Preview

This study intends to further the discussions about the ARC's contributions to the cyber mission. There are opportunities to increase cyber mission effectiveness by selectively leveraging the expertise some Airmen gain and use during their civilian employment.¹⁵

The second chapter provides the necessary background for the recommendations provided later in the study. The first section describes the three significant milestones in the history of the national military policy debate and its impact on current events. The second half describes an approach to thinking about cyberspace that will highlight the similarities and unique challenges the DOD is facing compared to the four physical domains.

¹¹ The official definition of Information Operations is "The integrated employment, during military operations, of information-related capabilities in concert with other lines of operation to influence, disrupt, corrupt, or usurp the decision-making of adversaries and potential adversaries while protecting our own. Also called IO. See also computer network operations; electronic warfare; military deception; military information support operations; operations security." (Source: SecDef Memo 12401-10) from the DOD Dictionary of Military Terms (http://www.dtic.mil/doctrine/dod_dictionary) accessed 22 Jan 2013.

¹² Three policy options for the Public Affairs community in the messaging and content aspects of cyber operations is discussed in Robin K Crumm, "Information Warfare: An Air Force Policy for the Role of Public Affairs" (Air University, 1996), 31–41.

¹³ A unit type code is a system created by the Joint Chiefs of Staff that uniquely identifies a capability in five characters.

¹⁴ Gregory F Treverton et al., *Attracting "Cutting-Edge" Skills Through Reserve Component Participation* (Santa Monica, CA: RAND Corporation, 2003), 2.

¹⁵ The author recognizes that most billets and personnel will be assigned to UTC coded billets and focused on augmenting AD capabilities. The USAF and AFRC senior leadership will determine the percentages through existing Total Force Enterprise processes. See AFI 90-1001 for additional details.

Chapters Three and Four provide historical analogies of two distinct solutions the USG created to meet security needs. During its short, nearly four-year existence from 1941 until 1945, the Coordinator of Information (COI) and Office of Strategic Services (OSS) were the USG's first formal civilian organization and military unit, respectively, authorized to accomplish sabotage and centralized intelligence. The second historical analogy is the Civil Reserve Air Fleet (CRAF) program, a contract that enables the USAF to meet some of its wartime and peacetime airlift requirements through US commercial carrier capabilities. The two historic analogies were selected because they provide dissimilar yet successful examples of DOD satisfying gaps in its AC. When the Joint Chiefs of Staff (JCS) worked with the President to make the OSS a direct reporting agency, they gained complementary capabilities to conventional Army units.¹⁶ For over sixty years the CRAF program continues to provide a capability that satisfies the DOD surge airlift requirements and simultaneously provides acceptable profit for the assumed risk.

The fifth chapter analyzes the ARC's contribution to the cyber enterprise through the lens of culture, cost and risk. As each key variable is reviewed, the relevant examples from the two historical analogies are discussed and then applied to the ARC cyber enterprise.

The sixth chapter provides the resulting three recommendations to improve the ARC contribution to the cyber mission. AFRC and ANG leadership can implement the three basic recommendations. Each of them calls for a different level of action (ARC, unit and individual).

The concluding chapter discusses anticipated implementation challenges and provides cautions regarding maximizing the impact of citizen Airmen in the cyber mission set.

¹⁶ While its name has remained the same since its creation, the Goldwater-Nichols Act of 1986 established the current roles of the JCS and its Chairman.

Chapter 2

Part-time Bytes: The Cyber Dilemma and the American Militia

The forms of military institutions must be determined on political grounds, with due regard to national genius and tradition. The military pedant may fail by proposing adequate and economical forces under forms that are intolerable to the national genius.

Colonel John McAuley Palmer, October 1919

Context matters. The vantage point or points one takes when framing the answer to a question biases the solution. Choosing a different context would likely lead to different recommendations. This chapter addresses two broad areas (cyberspace and military policy) sufficiently to frame a meaningful discussion of the research question. Harold Winton, US Army, LTC (ret) and Ph.D. in History from Stanford University, wrote that strategy balances an “historical awareness to look backward in time to assess probabilities and trends [with a] creative imagination to look forward in time to assess the significance and potentialities of new and changing circumstances.”¹ This thesis looks backward and forward in time at the interaction between cyber and military policy.

At the outset of this project the research question was considered with a narrow focus. The background chapter was anticipated to focus on the details of the National Guard (NG) and Reserve processes to meet active duty cyber requirements.² The anticipated analysis would have led to actionable recommendations based on higher fidelity information in this background chapter.

During the research the longer historical perspective provided richer insights, yet shifted the detailed, actionable recommendations to a future work. Once the broader perspective was selected there were viable alternative perspectives in addition to military policy. They are mentioned in the thesis yet given less attention: economics of the militia and reserve components, laws about active and reserve federal military forces and National Guard, and the motivations of elected officials. Instead, the background chapter (and ensuing two historical analogies) captures the relevant key themes and patterns over a longer period, yet acknowledges the underlying complexity. Unlike the previously discussed options, the cyber section was foundational to this research and unable to be substituted. The cyber environment is discussed first (before an

¹ Winton, Harold, “Strategy: A Definition and Brief Elaboration”, unpublished. His definition of strategy as “the craft of advantageously bending the arc of the future in large-scale activities of significant consequence” assumes there is an existing trajectory and working within the art of the possible. [Unclear—rewrite.]

² The 54 National Guard can receive requirements from their Governor or equivalent in addition to the federal government. For sake of clarity, the state requirements are not explicitly mentioned every time.

explanation of military policy) to provide contrast to the longer military tradition of combat in the other four domains.

Cyber environment

The cyber environment is the subject of much debate, angst and also expenditures within both public and private sectors. This section will describe the key aspects of the cyber environment with special attention to the USAF perspective. This section can be summarized using two rhetorical questions. Do we as a service understand cyber? Do we have a stable, defined military role within cyber? Most would answer these two questions with a negative response. With that in mind, it leads to a more detailed articulation of the central question of this study: with ongoing DOD and USAF investments in cyber, how can the part-time ARC Airman contribute to increasing the AF's rate of learning and adaptation regarding its contribution to the DOD cyber mission?³

When academics and practitioners are unable to create a consensus definition, it is an indication of the inherent immaturity of the field. Since this thesis is not trying to solve that problem, it will describe the options and their impact. This section will start with a broad discussion of the larger context of cyber as it relates to international relations and military strategy and theory. The final portion will address cyber from an AF perspective.

Assertion: Cyber is civilian

The roles and interplay between theory, strategy and planning are important in an environment, or from the DOD perspective domain, that, at its core, is technology based. Everett Dolman wrote “theory and doctrine do more than just coordinate and illuminate. The difference between theory or doctrine-driven strategy and, say, technology-driven strategy is profound. The first integrates new technology into a coherent vision; the latter abandons foresight and follows the apparatus wherever it leads. One is proactive, the other reactive. One wins, the other loses. When one accepts the authority of technology (or economics, or any other dimension) over strategy, the analogy is to the child who receives a hammer for a gift. Suddenly, a world of nails appears, and they all need pounding.”⁴ Strategy and planning can also be confounded. Some strategists prefer to frame the discussion in terms of ‘better and worse’ and effectiveness.

³ A holistic review of benefits for the nation and employers was beyond the scope. Maj Nelson Rouleau addresses the macro level contributions the AF provides to national grand strategy in his SAASS thesis.

⁴ Everett C. Dolman, *Astropolitik - Classical Geopolitics in the Space Age* (New York, NY: Frank Cass Publishers, 2002), 148–149.

Planning can be viewed as the most efficient way to accomplish an objective, although the effects of a thinking adversary must be kept in perspective.

The environment a strategist works in is “a world order where the threats are both diffuse and uncertain, where conflict is inherent yet unpredictable, and where our capability to defend, and promote our national interests may be restricted by materiel and personnel resource constraints. In short, an environment marked by volatility, uncertainty, complexity, and ambiguity (VUCA).”⁵ As our early experience with cyberspace demonstrates, those characteristics continue to intensify, making simple cause and effect approaches problematic.⁶

There is a range of doctrinal approaches to war, with multiple driving variables. In its simplest terms, one spectrum could be broadly viewed with the Clausewitzian “war is politics by other means” and the Law of Armed Conflict on one side, and a total conflict on the other. The former, generally considered the western way of war, espouses violence as an essential aspect of war. The latter has been advocated by a growing number of Chinese military doctrine writings. In addition, espionage and sabotage are legally distinct activities from war, although they can (but do not have to) occur as part of an armed conflict. Digital communications have altered the time and space aspects as physical presence in a state is no longer essential. Cyber enabled espionage challenges the previously distinct peer roles and relationships of governments, militaries, law enforcement entities and corporations.

When the Department of Defense designated cyberspace as a domain, it joined the existing four doctrinally defined physical domains of land, sea, air and space.⁷ One unique aspect of the cyberspace domain is that it operates according to human specified rules that continue to change. Unlike the air and sea domains, most of the physical infrastructure and devices associated with cyberspace “commons” are privately owned. As a result, the 2011 National Military Strategy differentiates between the global commons, “shared areas of sea, air and space” and the globally connected domain of cyberspace.⁸ The private ownership of cyberspace requires employees to create, operate and maintain it.

An Air University Fairchild Papers publication, *Employee Warriors and the Future of the American Fighting Force* proposed an answer to the question: “What military culture do we need

⁵ Roderick R Magee, *Strategic Leadership Primer* (Carlisle Barracks, PA, 1998), 1.

⁶ Harry R Yarger, *Strategic Theory for the 21st Century: The Little Book on Big Strategy*, 2006, 19–20.

⁷ While the DOD has definitions for the five domains, it does not have an approved definition of domain. Basla, Michael, *Defending the Cyber Domain*, <http://www.afspc.af.mil/library/speeches/speech.asp?id=675> (accessed May 18, 2013).

⁸ Michael G Mullen, “The National Military Strategy of the United States of America, 2011 : Redefining America’s Military Leadership.,” 2011, 3.

to equip tomorrow's cyber warriors?" With the benefit of hindsight the argument of the "military's adoption of commercial business paradigms and identities" underestimated the interplay of technology and pop-culture on the military culture.⁹ The comparison of the military culture with the business-scientific culture highlights the tension in competing objectives. Two relevant significant differences are the overlap of skills, experience, and hardware between the military and civilian sectors, and the role of knowledge workers. Given the lack of transparency in cyber operations due to American classification rules, it is difficult to objectively measure the former. Since the commercial sector can adapt to innovations quicker than DOD and other government organizations, the part-time ARC Airmen can bring experience with the latest tools.

Brigadier General "Billy" Mitchell wrote in his 1925 *Winged Defense*, that Airmen maintainers "could be kept in an advanced degree of instruction while occupied with their civil pursuits. Mechanics working in automobile factories would require very little instruction to make them expert air mechanics.... As a matter of fact, it is better for them to be working in civil life most of the time [because] ... they are apt to lose their keenness and their capacity for work." His recommendation was not followed for various reasons including the specializing of military aircraft from their commercial basis and the amount of military flying accomplished from assigned and deployed locations.¹⁰ The military's round the clock dependence on the internet and other networks requires full time employees. His vision has direct applicability to many aspects of contemporary cyberspace given the common hardware and transferrable knowledge and skills.

Military Policy

While cyberspace has existed for several decades, the policy debate concerning the proper reach of the American military can be traced back over 300 years to the colonial era. The policy issues have not changed and include technological, political economy, and cultural factors. Politicians and citizens debated the role of the militia and regular army, the cost, and the threat then and now. This section will address the history of the national military policy debate by discussing the three most significant policies – two laws and DOD policy. The two laws were the Militia Acts of 1792 and 1903 (the latter also known as the Dick Act). The Total Force policies

⁹ HS Vest, *Employee Warriors and the Future of the American Fighting Force*, 2002, ix. From introduction "took a "practical and conceptual look at some of the deep cultural patterns of change within today's [circa 2002] military society. The adoption of civilian business paradigms and attitudes of social democracy into the realm of the modern military has ushered in a host of changes and conflicts""

¹⁰ William Mitchell, *Winged Defense the Development and Possibilities of Modern Air Power--economic and Military* (Tuscaloosa, AL: University of Alabama Press, 2009), 179. The Chapter VIII entitled *Air Force Personnel* makes an interesting read if one considers his argument and substitutes cyber for air, especially the beginning and ending pages.

and directives issued by the DOD continue to mature since their substantive beginning in the 1970s. The overarching role of government and the interaction of civilians and military leadership will provide context for the ensuing historical overview.

One fundamental responsibility of a democracy is to answer the question, “How can people organize themselves so as to preserve their liberties and advance their interests?”¹¹ The ensuing civil-military problem can be captured in a simple paradox – “the very institution created to protect the polity is given sufficient power to become a threat to the polity.”¹² The field of civilian-military relations theory addresses how the senior leaders of both the civilian government and military execute their responsibilities. Samuel Huntington’s core claim in his 1957 seminal work *The Soldier and the State* was that “increased external threat confront[ing] the United States during the Cold War would drive US civil-military relations into a pathological condition that would cause the United States to lose the Cold War *unless* this natural tendency was counteracted by [Huntington’s] remedial steps.”¹³ Morris Janowitz’s famous 1960 counter *The Professional Soldier* “disagree[d] with Huntington concern[ing] whether the old divisions of labor were still desirable, not whether there was any essential difference between the two roles.”¹⁴ Peter Feaver, a former student of Huntington’s, proposed his ‘agency theory’ based on principal-agent literature’s claim that “delegation need not be an abdication of responsibility.”¹⁵ Feaver summarizes “the agency problem of working and shirking arises because of civilian-military disagreements over means, if not ends, which itself arises from inherent differences in the roles played by civilians and the military.”¹⁶ The previously mentioned scholars propose different ways of implementing some of the Constitution’s shared powers.¹⁷

In his five volume series on American political economy from 1606 to 2011, Paul Koistinen documents the interrelationships of political, economic, and military institutions in devising the means to mobilize resources for defense and to conduct war. He identifies four essential factors to determine the method of mobilization. “The first is economic—the level of maturity of the economy; the second is political—the size, strength, and scope of federal government; the third, military – the character and structure of the military services and the

¹¹ Peter Feaver, *Armed Servants : Agency, Oversight, and Civil-military Relations* (Cambridge, Mass.; London: Harvard University Press, 2005), 4.

¹² Feaver, *Armed Servants*, 4.

¹³ Feaver, *Armed Servants*, 16.

¹⁴ Feaver, *Armed Servants*, 8.

¹⁵ Feaver, *Armed Servants*, 55. There are specific uses of the words working and shirking. “Working, in the broadest sense of the word, means doing something to the principal’s satisfaction. Shirking means not doing it to the principal’s satisfaction.” (Feaver, *Armed Servants*, 60.)

¹⁶ Feaver, *Armed Servants*, 60.

¹⁷ Interview with Dr. Kevin Holzammer, May 6, 2013.

relationship between them and civilian society and authority; and the fourth is the state of military technology.”¹⁸ This framework can aid discussions regarding the various costs associated with military forces, and more broadly with government responsibilities.

Militia Act of 1792

The initial colonial defense consisted of militia formed by able-bodied men. These local defense forces were not, in modern military vernacular, organized, trained and equipped for what would become the American Revolutionary War.¹⁹ The militia was a sufficient force for its original purpose of “maintain[ing] the public peace and protect[ing] colonists from Indian raids and other external security threats.”²⁰ Russell Weigley, a prolific military historian and originator of *The American Way of War*, wrote in his 1967 classic *History of the United States Army* about motivations and purpose:

[The men in the militia] would fight when they had to, to preserve the homes and farms and way of life they had crossed the ocean to find. But they did not wish to abandon homes and farms for months or a season, to go off soldiering in pursuit of objects only remotely connected with their own aspirations or security. Military training did not prepare them for extended campaigns, nor did militia organization befit the maintenance of long expeditions. A long campaign to distant fields that also involved meeting Indian tactics of stealth and ambuscade was a campaign for which colonial militia, except units recruited from frontiersmen, were especially unsuited. When the French and Indian War demanded such campaigns, the militia system did not suffice. Therefore regiments of the British regular army appeared in America, to fight the French and their Indian allies and to add their contribution to the influences that were to shape the United States Army.²¹

The individual colonies through their local officials structured their laws and civic responsibilities based on their perceived threats and security objectives. The colonies were too poor to afford a sufficient full time force. As the frontier expanded, firearm and forest survival skills atrophied.²² Weigley states the thesis of his book as a task. “Though the historian of the Army may try to shun Uptonian [not utopian] partisanship, the historic tension between the two American armies,

¹⁸ Paul A. C. Koistinen, *Beating Plowshares into Swords* (Lawrence, Kan: University Press of Kansas, 1996), 1.

¹⁹ Hugh Jameson, “Equipment for the Militia of the Middle States, 1775-1781,” *The Journal of the American Military Institute* 3, no. 1 (1939): 26.

²⁰ Patrick Todd Mullins, “Militia Clauses, the National Guard, and Federalism: A Constitutional Tug of War,” *Geo. Wash. L. Rev.* 57 (1988): 330.

²¹ Russell Frank Weigley, *History of the United States Army*, Enl. ed (Bloomington: Indiana University Press, 1984), 12.

²² Weigley, *History of the United States Army*, 10.

professional and citizen, must remain his major theme.”²³ The military policy debate was a subset of the larger debate over the proper goals of a republic and where the balance lay between federal and states’ rights.

With his Federalist views, then-Colonel George Washington profoundly impacted the perception of the militia. “The militia had done better in earlier wars when its members had responded to attacks on their own homes. But in the Great War for Empire, part-time soldiers demonstrated that they felt no inclination to take the field for extended campaigns that did not involve their own interests and aspirations in any direct ways that they could understand. The militia system had shown it could be useful when the citizenry felt involved in a military crisis. It was not a fit instrument for prolonged warfare on distant frontiers.”²⁴ Based on his observation of “British regulars in action, his fondest hope for his Virginia provincial troops was they might pattern themselves on the regulars.” Washington wrote, “Discipline is the soul of an army. It makes small numbers formidable; procures success to the weak, and esteem to all; and may, in a peculiar manner to us, who are in the way to be joined to Regulars in a very short time, . . . [be the means of distinguishing us] from other Provincials.”²⁵

Thomas Jefferson was an Anti-Federalist leader of the opposing position who believed in the militia and was against a standing army. In the early 1790s, he wrote about the possibility that ‘every rag of an Indian depredation will . . . serve as a ground to raise troops with those who think a standing army and a public debt necessary for the happiness of the United States and we shall never be permitted to get rid of either.’²⁶ Years later in his inaugural address in March 1801, he addressed the “principles [that] formed the bright constellation which has gone before us, and guided our steps through an age of revolution and reformation, . . . a well-disciplined militia, our best reliance in peace, and for the first moments of war, till regulars may relieve them

²³ Weigley, *History of the United States Army*, xii. Weigley’s book was, as the author wrote in the preface, was a response to Emory Upton’s “contemptuous” book and “an attempt to weigh the merits of both armies fairly. Not all histories have done so. No history of the United States Army existed until Secretary of War Elihu Root saw to the publication of Brevet Major General Emory Upton’s *Military Policy of the United States* in 1904. Upton was a Regular Army professional bitterly contemptuous of citizen soldiers.” (Weigley, *History of the United States Army*, xi)

²⁴ Weigley, *History of the United States Army*, 16.

²⁵ Weigley, *History of the United States Army*, 28. Washington called for “a well organized Militia; upon a Plan that will pervade all the States, and introduce similarity in their Establishment Maneuvers, Exercise and Arms” in “Sentiments on a Peace Establishment” in May 2, 1783. (source it) According to a 1957 Library of Congress report, this support of “trained reserves was not quoted because it was lost in the archives for 147 years.” Library of Congress. Legislative Reference Service and Eilene Marie Galloway, *History of United States Military Policy on Reserve Forces, 1775-1957: Prepared at the Request of Overton Brooks, Chairman, Subcommittee No. 1, Committee on Galloway, National Defense Analyst* (US Government Printing Office, 1957), 447.

²⁶ Weigley, *History of the United States Army*, 104 Quoted in Harry M. Ward, *The Department of War, 1781-1789* (Pittsburg: University of Pittsburgh Press, 1962), 132-33.

...”²⁷ Yet he was a pragmatist who accepted the difficulty of implementation, and ended up signing legislation in 1802 to found the Military Academy at West Point.²⁸

In 1787, the Constitution created a different structure than those shared by the Continental Congresses of 1774 and 1775 and the Articles of Confederation drafted and ratified between 1776 and 1781. The military policy was but one aspect of the compromises between Federalists and Anti-Federalists, or states' rights advocates.²⁹ The Constitution also included provisions that addressed the funding of the two services - the Army and Navy.

The first significant military policy law, the Militia Act of 1792, was signed five years after the Constitution was initially drafted. According to a 1957 Library of Congress report, “A well-regulated militia was advocated by Washington, Jefferson, and Madison, and attempts were made to enable a law to insure an effective citizen army which would be called up in case of need. Public opinion, however, would not support an efficient militia system that might give more power to the Federal Government. The [Act] set the Federal seal of approval on the old militia organization with all its known weaknesses. Concurrent, voluntary State action was necessary for the proper execution of the law which contained no provisions for training and no penalties to aid in its enforcement.” Examples of the known weaknesses and inefficiencies of the military system were, “untrained and undisciplined troops and officers were required to provide their own weapons, ammunition, horses, and equipment; enlistments were for short terms; and the men formed essentially a local defense force under the control of each separate colony.”³⁰

The ensuing nineteenth century American wars highlighted challenges facing the new republic as it clarified the roles of federal and state governments in military policy, drafts, and payment. Areas of disagreement surrounding the War of 1812 included a state’s right to refuse to supply troops and the authorization for invading Canada. The common militia never made

²⁷ Weigley, *History of the United States Army*, 104. During the time of the Constitutional Convention, James Madison told the Virginia convention that “with respect to a standing army, I believe there was not a member in the Federal Convention who did not feel indignation at such institution.” Weigley, *History of the United States Army*, 86 From William A. Benton *Pennsylvania Revolutionary Officers and the Federal Constitution*, Pennsylvania History XXXI (1964), 422-23.

²⁸ Weigley, *History of the United States Army*, 104.

²⁹ The constitution states “The Congress shall have the Power . . . : [clause 15] To provide for calling forth the Militia to execute the Laws of the Union, suppress insurrections and repel Invasions; [clause 16] “To provide for the organizing, arming, and disciplining the Militia, and for governing such Part of them as may be employed in the Service of the United States, reserving to the States respectively, the Appointment of Officers, and the Authority of training the Militia according to the discipline prescribed by Congress; . . . To make all Laws which shall be necessary and proper for carrying into Execution the foregoing Powers.” (US Constitution Article 1, section 8, clause 15 and 16.)

³⁰ Library of Congress. Legislative Reference Service and Galloway, *History of United States Military Policy on Reserve Forces, 1775-1957: Prepared at the Request of Overton Brooks, Chairman, Subcommittee No. 1, Committee on Galloway, National Defense Analyst*, 442, 444. The Act required citizens to provide their own “good musket or firelock” along with other required items.

significant contributions after the War of 1812.³¹ The states continued their claim of “immunity against being used as an invading force” in the Mexican War of 1846-48, and “that short term enlistments are expensive and have the effect of lengthening the war.”³² The Civil War was two years old before “trained armies began to fight decisive battles.”³³ According to a 1939 report on the Selective Service, the Civil War era conscription policies “furnish a text on ‘How Not to Do It.’”³⁴ The Posse Comitatus Act of 1878 limited the use of Federal military personnel to enforce State laws, and was part of the bargain struck to resolve the Presidential election. During the Spanish American War of 1898, “it was apparent then … that the military system would have to be organized.”³⁵

Militia Act of 1903

The second significant American military policy was the Militia Act of 1903, also known as the Dick Act; it was named in honor of Charles W. F. Dick, a Major General in the Ohio National Guard and a US Senator who chaired the Committee on the Militia.³⁶ The law received broad support due to the efforts of Senator Dick and Secretary of War Elihu Root. It was an “Act to promote the efficiency of the militia” and an acknowledgement that the current, 111-year-old policy was not sufficient. The legislation repealed the Militia Act of 1792 and created the statutory basis for the contemporary National Guard.³⁷ The law designated the militia into two groups: the Reserve and Organized Militias, with the latter being the National Guard of the State, Territory or District of Columbia. The National Guard was authorized to receive federal funds

³¹ Koistinen, *Beating Plowshares into Swords*, 85–86.

³² Library of Congress. Legislative Reference Service and Galloway, *History of United States Military Policy on Reserve Forces, 1775-1957: Prepared at the Request of Overton Brooks, Chairman, Subcommittee No. 1, Committee on Galloway, National Defense Analyst*, 447.

³³ Library of Congress, *History of United State Military Policy on Reserve Forces*, 445, 448-450.

³⁴ “American Selective Service: a Brief Account of Its Historical Background and Its Probably Future Form. Prepared Under the Supervision of the Joint Army and Navy Selective Service Committee.” (U.S. Government Printing Office, October 1939), 9–11.

³⁵ Library of Congress. Legislative Reference Service and Galloway, *History of United States Military Policy on Reserve Forces, 1775-1957: Prepared at the Request of Overton Brooks, Chairman, Subcommittee No. 1, Committee on Galloway, National Defense Analyst*, 453.

³⁶ Charles William Frederick Dick,

<http://bioguide.congress.gov/scripts/biodisplay.pl?index=D000302> (accessed on May 1, 2013). Snook, David, *The Modernization of the National Guard (1900-1916)*, http://www.iowanationalguard.com/Museum/IA_History/Modernization.aspx. (accessed May 18, 2013).

³⁷ The legislation was drafted by the Secretary of War Elihu Root in coordination with Congressional and National Guard leaders. (William M Donnelly, “The Root Reforms and the National Guard,” *US Army Center of Military History* (2001).) Edward Coffman proposed that “efforts to reform War Department administration were similar to those in industry which created the modern corporation to control the operations of previously independent firms.” The historical background provides insights into the larger commercial and military cultures that lead to the Military-Industrial Complex. The centralization of the National Guard was just one implementation of a larger pattern. James Hewes, “The United States Army General Staff, 1900-1917,” *Military Affairs* 38, no. 2 (1974): 67, 70–71.

for equipment and summer training camps.^{38,39} Since this new funding came with increased regulations, many Guard officers viewed this as “an unwarranted intrusion into what traditionally had been state and local matters.”⁴⁰

The 1916 National Defense Act increased the Army’s authority and increased funding to the states. It authorized the Army to specify the number and types of a state Guard’s units. Reserve Officers’ Training Corps was created as a new commissioning source.⁴¹ An annual budget provided most of the Guard’s expenses, including paid drill, and eliminated the federal subsidy. The Military Bureau, the predecessor to the Title 10 National Guard Bureau was also authorized. The origins of a federal air reserve were created in two parts – the Officers and Enlisted Reserve Corps and increased funding for the Aviation Section of the Signal Corps.⁴²

The National Security Act of 1947 created the Air Force as an independent military service, yet did not impact the ongoing relationships with the Air National Guard and Air Reserve forces. There were five organizational predecessors over the slightly more than forty years between the original Aeronautical Division in the Signal Corps and service independence. Since separating from the Army, the Air Force has added missiles, space and cyberspace capabilities.⁴³

³⁸ A New York militia unit, currently designated as the Seventh Regiment, was the first unit to redesignate themselves as a National Guard, in honor of Major General Marquis de Lafayette, U.S. Army during his 1824 visit.

³⁹ Due to the continued reliance on state funding and lack of authority for the Army to specify what types of units could be formed, many states choose infantry units because they “were the cheapest ... to maintain and carried the most prestige.” Drilling was unpaid. (Donnelly, “The Root Reforms and the National Guard.”)

⁴⁰ Donnelly, “The Root Reforms and the National Guard.”

⁴¹ The role of the Morrill Act or Land Grant College Act of 1862 provided for military training at land-grant colleges and universities. It used the precedent in the Northwest Ordinance, passed in 1787 by the Congress of the Confederation, which provided one-sixteenth parcel of land in the new state for education. (William Stancik and R. Cargill Hall, “Air Froce ROTC: Its Origins and Early Yeras,” *Air University Review* (August 1984).) The NDA of 1916 allowed graduates of the four-year course who signed an oath to serve 10 years to be appointed Reserve Officers in the Officer Reserve Corps. The Army Air Service authorized the first Air ROTC programs in 1920. In 1946 AFROTC were created. (“History”, <http://afrotc.com/learn-about/history/> (accessed May 18, 2013)) The “Reserve Officers’ Training Corps Vitalization Act of 1964” provided ‘financial assistance’ contingent upon the member being willing to “accept an appointment, if offered, as a commissioned officer.” (Public Law 88-647, <http://www.gpo.gov/fdsys/pkg/STATUTE-78/pdf/STATUTE-78-Pg1063.pdf>, 1066-67. (accessed May 18, 2013))

⁴² Gerald T Cantwell, *Citizen Airmen: a History of the Air Force Reserve, 1946-1994* (Washington, D.C.: Air Force History and Museums Program, 1997), 5.

⁴³ Address multiple mission statements/visions -- “Since August 2008 the mission of the USAF is to ‘fly, fight and win...in air, space and cyberspace’”(<http://www.af.mil/main/welcome.asp> accessed February 22, 2013); <http://www.airforce-magazine.com/DRArchive/Pages/2008/August%202008/August%202008/NewMissionStatement.aspx> (accessed February 22, 2013).

Observations

There has been a dramatic shift in the perception of American force being used abroad, particularly offensively. The Articles of Confederation, Constitution, Amendments and the Militia Act of 1792 “precluded any explicit consideration of the use of American force abroad.” W. Taylor Reveley wrote that “peace was to be the customary state of the new nation. America would avoid aggressive war abroad, and in turn enjoy ‘an insulated situation’ from the great powers in Europe.”⁴⁴ The Constitution provided for the militia to “execute the Laws of the Union, suppress insurrections and repel Invasions.”⁴⁵ Though the constitution was never amended, subsequent law authorized the deployment of the federal military and eventually the National Guard.

During the Cold War, the shift in mobilization policy was solidified by the need to protect Europe from a Russian invasion through the Fulda Gap. Analysts determined that the existing Russian Army could overtake western Europe in three days if unimpeded. The previous American de facto policy from the Revolutionary War through WWII of having two years to mobilize an infantry was impractical. There is a relationship between time, cost and mission that changed the calculus for the standing army versus the part time solider and Airman in the Reserve and National Guard, today referred to as *force mix*.

Total Force – 1970s to present

The total force initiatives have been implemented via DOD policy and did not require changes to the law. The reserve and federal funding for Guard are provided through the same processes as AC funding, currently the annual National Defense Authorization Act (NDAA) and any emergency funding laws. A discussion of the total force should begin with the history of the distinct organizations.

The Air National Guard’s official birth date is considered the same day the USAF gained its independence, slightly 35 years after the first National Guard flight aviator participated in joint maneuvers.⁴⁶ The National Guard, which consists of two services (Army and AF), traces its history to the Massachusetts General Court declaration at the first muster on December 13, 1636.⁴⁷ The ANG history is well documented, so this section will address several salient

⁴⁴ W Taylor Reveley III, “Constitutional Allocation of the War Powers Between the President and Congress: 1787-1788,” *Virginia Journal of International Law* 15 (1974): 79.

⁴⁵ US Constitution, Article I, section 8, clause 15.

⁴⁶ Susan Rosenfeld and Charles J Gross, “Air National Guard at 60: A History” (n.d.): 4, 7.

⁴⁷ Michael Dale Doubler and John W. Listman, Jr, *The National Guard: An Illustrated History of America’s Citizen-Soldier* (Potomac Books, Inc., 2003).

aspects.⁴⁸ The political clout of the Guard, both Army and AF, through their State Governors and representatives, was highlighted during recent personnel reduction discussions. They can be ordered to service on federal or state authorities.⁴⁹ The Posse Comitatus Act only applies to Federal military forces, which grants the Guard additional flexibility.⁵⁰ The ANG contributes to many federal and state missions. The ANG has homeland defense and peacekeeping missions as well.⁵¹ ANG stood up its first space unit in 1996.⁵²

The purpose of the AF Reserve per United States Code, Title 10, is to “[p]rovide combat-ready units and individuals for active duty whenever there are not enough trained units and people in the Regular component of the Air Force to perform any national security mission.” The Reserve has ongoing improvements to its force presentation model. The Force Generation Center (FGC) consolidated multiple processes concerning how AC units request AF Reserve support. The Reserve generates its forces in two ways – unit type code (UTC) or individual augmentees.

The AFRC stood up the 960th Cyber Group (CYGP) on March 1, 2013, which consolidated ten units from other Reserve wings into the “one-stop shop for cyber [in AFRC].” The CYGP has received approximately 15 additional mission area requests from CYBERCOM. The citizen Airman’s “wealth of experience in cyber in their civilian jobs” was mentioned without specific plans on how to leverage them.⁵³ There have been several efforts to capture and leverage civilian skills, but the research uncovered limited successes.⁵⁴

Force development has been a priority for AFRC. In early 2013, it published guidance codifying its development team and succession planning processes, which were modeled after

⁴⁸ See “Air National Guard History”, <http://www.ang.af.mil/history/> and “Bibliography of Militia and National Guard History”, <http://www.whs.mil/library/NGB/Bibliography%20of%20Militia%20and%20National%20Guard%20History.pdf>.

⁴⁹ While AC and Reserve components can only be called under USC Title 10 “Armed Forces”, the National Guard can also serve under USC Title 32 “National Guard.” The Guard members serving under Title 32 only receive Federal credit for their service when the federal government is paying for their orders.

⁵⁰ The act was passed in 1878 in reaction to use of Federal military personnel to enforce state laws.

⁵¹ Jim Greenhill, “McKinley: Peacekeeping One Likely Guard Mission in Era of Persistent,” *Air Force News*, May 2009.

⁵² Rosenfeld and Gross, “Air National Guard at 60: A History,” 19–20.

⁵³ “Cyberspace: It’s a battlefield, and Air Force Reservists are getting more and more involved in the fight every day”, Citizen Airmen magazine <http://www.citamn.afrc.af.mil/features/story.asp?id=123341450> accessed April 17, 2013

⁵⁴ The AFRC/A6 prototyped a database called “Elite” to capture the technical skills of its reservists and better meet AF and Combatant Command (CCMD) requirements. The program has not transitioned to an operational system due to funding constraints. See Chapter 5, footnote 17 on Civilian Employment Information (CEI).

USAF processes.⁵⁵ The ARC requires the same PME for its officers and enlisted members, and has significantly fewer in-residence opportunities.⁵⁶

There are currently two Individual Mobilization Augmentee (IMA) programs with the seven RC organizations – Army and Air Force Reserve.⁵⁷ This thesis only addresses the AF IMA program, which is organized under the Reserve Management Group (RMG).⁵⁸ “IMA authorizations are individual military Air Force Reserve assets functioning as a total-force multiplier to augment the Air Force in war, contingency operations, and peacetime to meet National Defense, strategic national interest, and domestic objectives. IMAs are assigned against validated and funded positions on the regular duty component manning document.”⁵⁹ The IMA program started between WWII and the Korean War to have immediate access to trained military personnel in the event of a national emergency.

The genesis of Total Force is interrelated with the All-Volunteer Force (AVF) policy recommended by the Gates Commission and implemented by Congress in 1973. The AVF emerged in the mid-1960s as an alternative to conscription and the Vietnam War draft.⁶⁰ Its supporters justified the change on economic as well as political grounds. Senator Sam Nunn argued the opposition to the Vietnam War was the driving force being the “political child of the draft card burning, campus riots, and violent protest demonstrations of the late 1960s and early 1970s.”⁶¹ The shift from compulsory service was economically “quite modest” with an estimated cost of \$2.1B/annually for a 2.5 million member force with unspecified savings from increased retention resulting in increased productivity.⁶²

⁵⁵ AFRCI 36-2640 “Executing Air Force Reserve Force Development”, February 7, 2013.

⁵⁶ AFRC manages its school assignments through two different competitive boards: the Reserve Developmental Education Designation Board (RDEDB) and the Reserve School Selection Board (RSSB). The ANG selects its attendees through processes managed by the Guard Bureau.

⁵⁷ The seven reserve components are Air Force National Guard and Reserve, Army National Guard and Reserve, Navy Reserve, Marine Corps Reserve and Coast Guard Reserve.

⁵⁸ The Reserve Management Group (RMG) mission is to “seamlessly integrate wartime-ready Individual Reserve forces to meet Air Force and Combatant Commander requirements.” The RMG is undergoing significant restructuring combining detachments and was recently reorganized under Air Reserve Personnel Center (ARPC)/CC, who reports to the AFRC/CC.

⁵⁹ AFI38-201 section 9.1 Overview states “IMAs are individual members of the Selected Reserve or Participating Individual Ready Reserve assigned to an active component of the DOD or other U.S. Government agency in war, contingency operations, and peacetime to meet national defense, strategic national interest, and domestic objectives.” The DODI 1235.11 signed May 24, 2007 is entitled “Management of Individual Mobilization Augmentees.”

⁶⁰ Barbara A Bicksler et al., *The All-Volunteer Force: Thirty Years of Service* (Washington, D.C.: Brassey's Inc., 2004), xiii, 8.

⁶¹ Bicksler , *The All-Volunteer Force: Thirty Years of Service* , 23.

⁶² Bicksler , *The All-Volunteer Force: Thirty Years of Service*, 10. The \$2.1B net reflects the increased income tax revenue from the higher salaries. Similar to the universal military service discussed earlier, a mandatory national service was discussed by the group but not recommended.

With the background of the RC as a home defense force or basis for a large-scale mobilization, the Total Force initiatives started an ongoing trend of increasing utilization. The AF has been discussing Total Force since the 1970s under several evolving names: Total Force policy, Total Force Integration (TFI) and Total Force Enterprise (TFE). While the policies and implementation have matured, the essence of putting necessary capabilities in the RC is unchanged. In the new TFE processes started in 2012, senior leaders are provided objective data, including cost, on a range of options when determining the force mix within a given mission set.⁶³ The processes acknowledge the political dynamics of force allocation, including the location of units. The current process owner acknowledges current challenges in “quantify[ing] demand for missions not tied directly to warfighter sorties” and “quantify[ing] supply in mission areas where the manpower is not defined by UTCs.”⁶⁴

According to law and policy, the seven Reserve Components (RCs) were strategic reserves until November 2008. In addition, prior to September 2001, the recalls of the reserve components were limited to major national crises. Because of the significant RC participation from 2001 to 2008, the Secretary of Defense (SECDEF) signed DODD 1200.17 *Managing the Reserve Components as an Operational Force* in 2008. It stated that “DOD policy [is] that the RCs provide operational capability and strategic depth.”⁶⁵ The memo focused on the units that require a deployment to an Area of Responsibility (AOR). Due to the ongoing cyber operations and the difference in domains, the AC and ARC are continually conducting operations. This presents an opportunity for changes to allow ARC Airmen interested in completing two years of requirements in a single year.⁶⁶ There has not been a change in policy regarding minimum service commitments since the reserve was created, even though there have been many cultural changes and technological innovations that challenge original policy assumptions.

⁶³ See AFPD 90-10 and AFI 90-1001.

⁶⁴ “Total Force Enterprise (TFE) Management”, AF/A8XF, January 29, 2013.

⁶⁵ The Commission on the Nation Guard and Reserve recommended “the current reserve component categories … should be totally restructured.” It recommends that two distinct Operational Reserve Force and Strategic Reserve Force be established. (Commission on the Nation Guard and Reserve, 2008, 343-344) ; DOD Directive (DODD 1200.17, *Managing the Reserve Components as an Operational Force*, October 29, 2008, 1.

⁶⁶ Instead of serving 24 or 36 days/year, the member might perform duty for 50 or 70 days in year and then only need to maintain deployment readiness (PT test, CBTs, etc.) and any minimum proficiency requirements during the second year. As an active member of the ARC, the member would be eligible for non-voluntary mobilization. This flexibility in service could benefit the AF by allowing ARC to backfill or surge for AD needs. This could benefit the member by allowing them flexibility to focus on personal, family or civilian employment responsibilities. For example, some staff officers or help desk technicians might be using similar skills in their civilian jobs, so the gap in uniform service would not impact their AFSC proficiency.

Summary

This section described the key aspects of the cyber environment with special attention to the USAF perspective. It explained the answers to the two rhetorical questions: Do we understand cyber? And, do we have a stable, defined military role within cyber? The second half of the chapter was a review of American military policy and its implementation over more than three centuries. The history of military policy provides a broad context when one is considering making changes to the policy, whether at strategic or operational levels. The three policies of the Militia Acts of 1792 and 1903 and the evolving Total Force efforts highlight a trend. “Since the beginning of the Union the system has steadily evolved from one of almost no federal regulation to a modern system of virtually complete federal regulation and control” through the ‘federal recognition’ program and the federal funding required to accomplish the federally mandated missions.⁶⁷ The combination of federal funding and over eleven years of shared operational success have led to historically unusual levels of cooperation between the reserve and active components.

⁶⁷ Mullins, “Militia Clauses, the National Guard, and Federalism: A Constitutional Tug of War,” 331.

Chapter 3

The Office of Strategic Services

Prior to the US breaking its formal neutrality and entering the war in December 1941, some Americans had been making plans for an eventual entry and also providing supplies to their expected allies, all under the guise of neutrality. To facilitate the quick transition from peacetime capitalism to wartime production, the Government inserted itself into many aspects of American society, creating new federal organizations and expanding the responsibilities of existing ones.¹ Espionage and covert operations were not new to American military forces, but unlike other leading nations, the US did not have a formal organization. The US government started to change its intelligence structure and accelerated the process after the attack on Pearl Harbor. The Coordinator of Information (COI) and its re-designation as Office of Strategic Services (OSS) complemented the well-planned national mobilization.² It was “an experiment that lasted only a few years. The fact that the OSS did not reach full maturity and did not become constrained by predictable bureaucratic limitations provides an important record of both success and failure.”³

This chapter starts with a brief history from its formal creation in 1941 to its formal termination on September 30, 1945. A structural and organization summary, recruitment, and mission and culture provide relevant information for the eventual discussion of Air Reserve Component (ARC) contributions to the cyber mission. These observations, however, will be mindful of contextual differences between the OSS and the present cyber dilemma, to increase the likelihood of useful applicable recommendations.

History

The authorities of the COI and those of its successor, the OSS, went through significant changes from President Roosevelt’s original vision to its abrupt termination after the conclusion of the war.⁴ The historical context of political and cultural reality, existing government capabilities, and leading personalities will shape our understanding.⁵ While thorough examinations of the OSS exist, this brief history section will include the key points related to the

¹ While in WWII, “Military” referred to Army, this thesis uses military to refer to armed forces, and army to refer to the specific service. Navy and Military Departments

² Bradley F Smith, *The Shadow Warriors: OSS and the Origins of the CIA* (New York, NY: Basic Books, 1983), xv.

³ *The OSS Model and the Future SOF Warrior* (Fort Bragg, NC, n.d.), v.

⁴ The current United States Code was first published in 1926.

<http://www.gpo.gov/fdsys/browse/collectionUScode.action?collectionCode=USCODE>, (accessed January 21, 2013).

⁵ The seminal works on OSS are Kermit Roosevelt’s “War Report of the OSS, volumes 1 and 2” and Bradley F. Smith’s “The Shadow Warriors.” William J Morgan’s “The O.S.S and I” is also influential.

creation, sustainment and eventual termination of the OSS. The key offices within the OSS will be discussed, along with their contributions to the war.

Ideas regarding subversive activities grew during the Interwar years. Adolf Hitler created an aggressive, potent military force to accomplish his political objectives. On May 10, 1940, a 78 member specially trained German airborne force seized Belgium's main defensive position at Eben Emael. By May 21 German Panzers made it to the English Channel. While known to be false now, French, British and American authorities received significant numbers of tips from their citizens about alleged subversive activities by Nazi fifth column agitators.⁶

The isolationist American policies during the 1930s resulted in the US military being ill prepared for the looming conventional war and its subversive components. While politically unable to formally associate American security with British survival, the US Secretaries of War, Navy and State wanted to provide them assistance. At the same time, American leaders needed to focus on rebuilding their own nation's military capability. Existing intelligence efforts were "small, cautious, poorly funded, and hobbled by decades of bureaucratic infighting."⁷ A large majority of American foreign intelligence was gathered by attaches and diplomats.

In the growing concern regarding fifth column subversive activities in the US and the insular intelligence functions, President Roosevelt appointed William "Wild Bill" Donovan, a World War I (WWI) Medal of Honor recipient, as the leader of the civilian organization COI on July 11, 1941. The President wanted to organize the parochial, disparate departmental intelligence arms in the Army and Navy, and State Department with a civilian coordinator who reported directly to the White House. In discussions before the appointment, Donovan's vision was for an organization to "support military operations in the field by providing research, propaganda and commando support."⁸ His "broad and bold" vision of unconventional warfare was impacted by his earlier visits to England. "Initially he planned a combined centralized intelligence and subversive operations agency that would include more gathering and coordinating intelligence and staging guerrilla and commando operations behind enemy lines."⁹ Historian Thomas F. Troy wrote COI was "a novel attempt in American history to organize research, intelligence,

⁶ Smith, *The Shadow Warriors: OSS and the Origins of the CIA*, 11–12, 15, 21. The now known to be myth of Germany fifth column activities were persuasive enough that on 13 May British authorities interned male aliens in the British Isles. Smith, *The Shadow Warriors: OSS and the Origins of the CIA*.) The American internment of Japanese Americans occurred shortly after the attack on Pearl Harbor. "In the whole of 1939 only 1,600 reports of alleged sabotage were made to the FBI, 2900 such reports were received on a single day in May 1940!" (Smith, *The Shadow Warriors*, 15.)

⁷ Smith, *The Shadow Warriors*, 11-15.

⁸ <https://www.cia.gov/library/center-for-the-study-of-intelligence/csi-publications/books-and-monographs/oss/art06.htm>, (accessed January 21, 2013.)

⁹ John Whiteclay Chambers, *OSS Training Areas in National Parks and Service Abroad During WWII*, n.d., 561.

propaganda, subversion, and commando operations as a unified and essential feature of modern warfare; a ‘Fourth Arm’ of the military services.”¹⁰

The COI initially had several classified and unclassified core functions, black and white, respectively. As a result of political battles, the “white” function in its (unwritten) mandate from President Roosevelt was moved to the Office of War Information (OWI).¹¹ The remaining COI functions were designated the OSS, a military organization, on 13 Jun 1942 under the Joint Chiefs of Staff (JCS). As a result, Major General Donovan was in charge of an organization that would eventually grow to 13,000 people.¹² The OSS had a reputation of being an “irresponsible band of civilian enthusiasts who could cause considerable trouble for the military high command.”¹³ The culture Donovan created clashed with the regular military establishment. Externally they were viewed as a “free-wheeling, improvised group of amateurs,”¹⁴ a description which did accurately capture their lack of formal Army protocol and discipline. William J Casey, an OSS member and Director of National Intelligence from 1981 to 1987, wrote “You didn’t wait six months for a feasibility study to prove that an idea could work. You gambled that it might work. You didn’t tie up the organization with red tape designed mostly to cover somebody’s ass. You took the initiative and the responsibility. You went around end; you went over somebody’s head if you had to. But you acted. That’s what drove the regular military and the State Department chair-warmers crazy about the OSS.”¹⁵ The different culture was driven by the mission. Donovan’s vision was that a specialized organization focused on “intelligence, deception, subversion, and physiological and irregular warfare could spearhead the Allied liberation of Europe and the Far East.”¹⁶

The end of the war combined with the death of OSS’s strongest advocate President Roosevelt resulted in the organization’s abrupt end. Federal Bureau of Investigations (FBI) Director J Edgar Hoover seized the opportunity to “draw his long knives” and work with the newly sworn in President Harry S. Truman.¹⁷ Many of the capabilities were eventually

¹⁰ <https://www.cia.gov/library/center-for-the-study-of-intelligence/csi-publications/books-and-monographs/oss/art02.htm>, accessed 19 Jan 2013.

¹¹ <https://www.cia.gov/library/center-for-the-study-of-intelligence/csi-publications/books-and-monographs/oss/art03.htm>, accessed 20 Jan 2013. Smith, *The Shadow Warriors: OSS and the Origins of the CIA*, 167.

¹² Donovan was promoted to Major General from Colonel (skipping Lt General) as part of the creation of the OSS.

¹³ Smith, *The Shadow Warriors*, 166.

¹⁴ Chambers, *OSS Training Areas in National Parks and Service Abroad During WWII*, 565.

¹⁵ Susan L. Kerr and John D. Gresham, “OSS Society - Keeper of Gen Donovan’s Flame,” *The Year in Special Operations*, n.d., 88–93.

¹⁶ Chambers, *OSS Training Areas in National Parks and Service Abroad During WWII*, 557, 11.

¹⁷ Kerr and John D. Gresham, “OSS Society - Keeper of Gen Donovan’s Flame,” 89.

reconstituted between new organizations – the Central Intelligence Agency and Special Operations Forces. Some view that the OSS was destined to be the CIA, yet Bradley Smith proposes the continuity “lies less in structural schemes and more in the wartime experiences of the organizations and the prominent people associated with them.”¹⁸

Perception played a key role throughout the creation and sustainment of the COI and OSS. Initially there was an American antagonism to anything secret, which many OSS activities were.¹⁹ Clashes between OSS members and the rest of the military reduced effectiveness. According to several leading historians, the personalities of key leaders, especially Donovan, and general demographics of unit members negatively impacted the perception and effectiveness of the OSS. Donovan’s vision and can-do attitude impacted the OSS positively, yet his lack of interest in administrative and bureaucratic activities significantly contributed to its demise at the war’s end.²⁰

Structure and Reorganizations

Given the frequency of organization changes, this thesis will discuss the divisions within OSS in November 1944 and their accomplishments. The key divisions were Research and Analysis (R&A), Special Intelligence (SI), Special Operations (SO) and its Detachment 101, and Counter-intelligence (X-2). During the late 1930s and early 1940s the British provided formal and informal assistance and advice at multiple levels that significantly impacted the President, COI and OSS. The influence of British organization with its separate Special Operations Executive (SOE), Secret Intelligence Service (SIS) and British Counter Espionage were driving forces in the creation of a parallel American organization – SO, SI, and X-2, respectively.²¹

In November 1944 the R&A had approximately 1200 people, including 400 overseas. It was created under COI and was not disbanded at the end of WWII. It eventually was aligned under the Central Intelligence Agency (CIA), when it was established by the National Security Act of 1947. Since it was to “maintain the objective and independent approach so essential a prerequisite to accurat[e] interpretation and evaluation” it was appropriately organizationally positioned near the President yet without policy-making responsibilities.²² As will be discussed in more detail later, it recruited respected economists, geographers, political scientists and

¹⁸ Smith, *The Shadow Warriors: OSS and the Origins of the CIA*, 164.

¹⁹ Political acceptability (Political Aspect – “Gentlemen don’t read each other’s mail!” (Edward Hymoff, *The OSS in WW II* (NY : Richardson and Steirman, 1986, 24) .

²⁰ Chambers, *OSS Training Areas in National Parks and Service Abroad During WWII*, 562. For example Donovan was referred to as an “abysmal administrator.”

²¹ Smith, *The Shadow Warriors: OSS and the Origins of the CIA*, 164, 167.

²² Kermit Roosevelt, “War Report of the OSS,” *Walker and Co. New York* 123 (1976): 167.

historians who brought their practices from academia with them.²³ R&A created reports based on “new techniques for determining the intentions and capabilities of other nations” from publicly available information in national and foreign language newspapers and magazines, and the Library of Congress.²⁴ In one of the definitive books on the OSS, Bradley F. Smith devotes a chapter to documenting how R&A “adjusted academic scholarship, and publication methods to the requirements of the government [because they were] a matter of some significance.”²⁵ Not surprisingly, the 900 scholars were “little known by the public and unheralded by the media” compared to the operational branches.²⁶

The Special Operations (SO)²⁷ branch organized guerrilla campaigns in Asia and Europe. Several famous activities include 93 three-person Jedburgh teams that in 1944 joined with the French Resistance to prepare for the Normandy invasion. Operations Groups of specially trained commandos fought in Greece, France, Yugoslavia, Burma, Malaya, and China, typically alongside partisan formations. Another famous unit was Detachment 101 in Burma, which leveraged 120 Americans to recruit 11,000 Kachin who fought the Japanese occupiers.²⁸

The Secret Intelligence (SI) branch was not part of Donovan’s original vision, yet clandestine human reporting grew into a comprehensive foreign intelligence service with stations in Europe, the Middle East, and Asia. SI opened field stations, trained case officers, ran agent operations and maintained liaison contacts with foreign services. One of its most famous station chiefs was Allen W. Dulles, eventually to be the first civilian leader of the CIA. The OSS successfully partnered with the Army Air Forces (AAF) to “identif[y] a high percentage of targets attacked by the bombers and fighter bombers of Gen Chennault’s Army Air Forces. [This]

²³ Smith, *The Shadow Warriors: OSS and the Origins of the CIA*. Applied “analytic and interpretive skills theretofore not employed for intelligence purposes”

²⁴ It was not authorized MAGIC and ULTRA classified intelligence from the military services and Allies. (Smith, *The Shadow Warriors*, 172); <http://www.osstreborn.com/files/FlemingMemoDonovan.pdf> 27 Jun 41 memo from Ian Fleming to Donovan)

²⁵ Smith, *The Shadow Warriors: OSS and the Origins of the CIA*. J Ransom Clark maintains a bibliography on R&A at http://intellit.muskingum.edu/wwii_folder/wwioss_folder/ossr%26a.html (accessed 21 Jan 2013).

²⁶ Chambers, *OSS Training Areas in National Parks and Service Abroad During WWII*, 583.

²⁷ Originally named after branch chiefs for a while Special Activities Lt Col M. Preston Goodfellow (Army Reserve, no relation to the Goodfellow AFB, named solely for WW1 aviator 1Lt John J Goodfellow, Jr., of San Angelo TX, the closest town to the AFB)– SA/G, later to be SO and David K. E. Bruce SA/B, later to be SI (Smith, *The Shadow Warriors: OSS and the Origins of the CIA*; Chambers, *OSS Training Areas in National Parks and Service Abroad During WWII*, 27.)

²⁸ “Special Operations,” n.d., <https://www.cia.gov/library/center-for-the-study-of-intelligence/csi-publications/books-and-monographs/oss/art05.htm>. Other research stated 200 American versus 120, yet independent of the actual numbers the range indicates there was a significant leverage for American expenditures. (Chambers, *OSS Training Areas in National Parks and Service Abroad During WWII*, 590.)

relay[ed] information from its coast watchers to Admiral Halsey's fleet ... led to destruction of significant amounts of Japanese shipping.”²⁹

The X-2 counter-intelligence branch conducted a range of missions whose impact varied with geography and was able to recruit some of the best OSS talent. In Europe, X-2 partnered with both the British and Army and Navy intelligence to receive ULTRA and MAGIC intelligence. This enabled the branch and its British counterpart to run double agents against the Germans. X-2 successes included catching at least three Americans in Washington and severe compromises in China by clerical and housekeeping staffs.³⁰

The technical division led many innovations that are still used today. They include “magnetic limpet mines, self-contained underwater breathing devices, waterproof watches, swim fins, small mines shaped like insignificant camel, donkey or horse droppings (which later concealed small, fist-sized sensors/transmitters to signal enemy movement along jungle trails) and the “Liberator” pistol. The Joan-Eleanor was a small, hand-held radio that enabled communication between agents on the ground and overhead airplanes, and perhaps most importantly it could not be detected by enemy direction finding equipment.³¹

Recruitment

The COI and OSS hired people who required minimal training to complete their jobs. Especially in his operations divisions, Donovan wanted his recruiters to focus on those who were “calculatingly reckless with disciplined daring, who are trained for aggressive action.”³² Donovan viewed the ideal operator as a Ph.D. “who can [also] win a bar fight.”³³ His “glorious amateurs” could be grouped into two large demographics – soldiers (both volunteers and draftees) and prominent civilians. The military members were generally civilians who joined the military because of the war; in other words, there were few career military members.³⁴ Some of the branches were predominately military and others civilian.³⁵ Donovan went out of his way to attract business leaders and intellectual elites. “As war against Hitler loomed, more than a few of America’s leading citizens looked for opportunities to join the struggle against Nazism. (COI’s

²⁹ Chambers, *OSS Training Areas in National Parks and Service Abroad During WWII*, 585.

³⁰ “X-2,” n.d., <https://www.cia.gov/library/center-for-the-study-of-intelligence/csi-publications/books-and-monographs/oss/art07.htm..>

³¹ Chambers, *OSS Training Areas in National Parks and Service Abroad During WWII*, 586.

³² W J Morgan, *The OSS and I.*, (Norton, 1957), 21.

³³ *The OSS Model and the Future SOF Warrior*, 12. “Although this quote is commonly accepted and widely attributed to Donovan, its origin cannot be confirmed.”

³⁴ “Citizen soldiers at the time rather than career soldiers, often they were reserve officers.” Chambers, *OSS Training Areas in National Parks and Service Abroad During WWII*, 562.

³⁵ Civilians dominated SI, X2, MO and military for SO, OG and CB. (Chambers, *OSS Training Areas in National Parks and Service Abroad During WWII*, 562.)

successor, OSS, eventually drew such a high proportion of socially prominent men and women that Washington wits dubbed it ‘Oh So Social.’”³⁶ In the 1930s and 40s, students at the Ivy League schools “had ‘ready made’ social and political networks in Europe” which would help as Jedburghs or Operations Group (OG) officers.³⁷ Donovan and his senior leaders were successful in their previous endeavors – military and civilian – and created men and women “who showed initiative, imagination, intelligence and adaptability, people who could think imaginatively.” Because reliability was essential for the high stakes mission, recruiting occurred through personal connections and screening for necessary background.³⁸

In addition to the poor job market for professors, researchers were drawn to the opportunity to work under leaders with impeccable academic stature. The senior leaders were “well known in their fields, came from prestigious institutions, tended to be politically conservative, and had some experience of government service.”³⁹ It was impressive, given some expected “confusion and mismatch[es],” how quickly such a “new and experimental organization, was notably successful in so quickly assembling a group of such breadth and quality.”⁴⁰

Because of the changing operational environment, the OSS created innovative selection processes. Traditional job description based approaches were too slow because people were recruited for one position yet frequently ended up in another by the time they completed training and were sent overseas.⁴¹ As a result, the selection team used common. While after the war a member of the assessment team concluded the organization was not very successful in predicting performance overseas, the initiative was the start of something bigger.⁴²

The OSS received mixed reviews from its Army counterparts. “While OSS and SOE are hampered by poor staff work, their personnel in the field have done remarkably well.” General Caffey’s concluding comments were “They deserve credit and appreciation for their fine work...

³⁶ “COI Came First,” n.d., <https://www.cia.gov/library/center-for-the-study-of-intelligence/csi-publications/books-and-monographs/oss/art02.htm>.

³⁷ *The OSS Model and the Future SOF Warrior*, 12..

³⁸ This was especially true for officer recruits. Chambers, *OSS Training Areas in National Parks and Service Abroad During WWII*, 565.

³⁹ Smith, *The Shadow Warriors: OSS and the Origins of the CIA*, 74–75.

⁴⁰ Smith, *The Shadow Warriors: OSS and the Origins of the CIA*, 74-75. One mismatch involved a European specialist working West African communications.

⁴¹ Bryan Patrick Fenton, “The Historical Evolutionary Process, by Organization and Function, of the Office of Strategic Services’ Assessment and Selection Program” (U.S. Army Command and General Staff College, Fort Leavenworth, Kansas, 1999), 64.

⁴² Donald Wallace MacKinnon, *How Assessment Centers Were Started in the United States: The OSS Assessment Program* (Development Dimensions International, 1980), 12.

This method of warfare is a vast potential in obtaining military strategical [sic] and tactical objectives. No commander should ignore this potential.”⁴³

The innovation in the OSS contributed to other complementary developments. “Some military theater commanders wanted more … tactical intelligence about enemy forces deployed against them that could be used immediately. [This led to the AC’s] own commando-like units – Army Ranger units, Navy Underwater Demolition Teams and Marine Raider battalions, primarily for short-range penetrations, spearheading advances.”⁴⁴

The role and approach to classification changed with time too. “The British emphasis, carried over to OSS, on extreme secrecy and the “cloak and dagger” aspects of training, also seemed to have become less important as time went on, and although not abandoned, they were de-emphasized in contrast to the increasing importance of practical techniques of accomplishing the mission whether espionage, sabotage, commando operations or guerrilla leadership.”⁴⁵

Conclusion

The Allies in WWII may have won without the OSS. However, “Allied victory was expedited and many Allied lives saved by the extraordinary efforts of the men and women of Donovan’s’ comparatively small but highly dynamic organization.”⁴⁶ The OSS and its predecessor the COI were tailored organizations that provided complementary capabilities to the two services. The organizational adaptability and can-do attitude of its members received mixed reviews during and after the war, yet has a successful legacy in today’s Special Operation Forces and CIA. There are similarities for the Air Reserve Component to consider as they determine their role in the cyber enterprise.

⁴³ Chambers, *OSS Training Areas in National Parks and Service Abroad During WWII*, 590.

⁴⁴ Smith, *The Shadow Warriors: OSS and the Origins of the CIA*, 562.

⁴⁵ Smith, *The Shadow Warriors: OSS and the Origins of the CIA*, 562.

⁴⁶ Smith, *The Shadow Warriors: OSS and the Origins of the CIA*, 583.

Chapter 4

Civil Reserve Air Fleet

Airlift was to become the pawn in a bitter logistical battle. For within days our rate of advance was to be determined not by enemy resistance, but by the tonnage supplied our columns to keep them rolling.

- General Omar N. Bradley, regarding emergency airlift to General Patton's Army, August 1944

The use of commercial airlift to supplement its military counterpart started out as a response to a crisis and has become a formal government program and an accepted business model. The Civil Air Reserve Fleet (CRAF)¹ is a voluntary contract between the United States Air Force (USAF) and US airlines to provide mobility resources for passenger and cargo transport. Commercial carriers have a strong incentive to participate as most of the Department of Defense's (DOD) air transportation contracts are tied to CRAF participation. Since its creation, CRAF has balanced cost and risk. Congress has not authorized enough funding for the USAF to have enough organic airlift for wartime requirements; American commercial airlines are seeking to be profitable and minimize the impact of CRAF activation. The contractual and informal relationships between the USG and its commercial partners have adapted to changes in the economic, technological and military environments.

Airlift

Air Mobility Command (AMC) has three core capabilities: Air Refueling, Airlift, and Aeromedical Evacuation (AE). AMC is US Transportation Command's (USTRANSCOM's) Air Force component command responsible for providing strategic and tactical airlift,² air refueling, and aeromedical evacuation services for the US forces. It also plays a critical role in delivering humanitarian support worldwide.³

¹ The CRAF technically refers to the contract specifying USG's ability to use commercial airplanes to support wartime needs. In most literature, however, CRAF is used more broadly to include the US airline contracts to support DOD's steady state air transport requirements.

² The three size categories of cargo in increasing order are standard, oversized and outsized. Standard cargo fits on a 463L pallet. ("Defense Transportation Regulation – Part VI SYSTEM 463L PALLETS AND NETS," n.d., accessed January 18, 2013). Oversized cargo is a HMMV and oversized is a tank, semi or shipping container. The former is air transportable on the C-5, C-17, C-130, KC-10 and most civilian contract cargo carriers, while the latter is limited to a C-5 or C-17 aircraft or surface transportation. ("DOD Dictionary," n.d., http://www.dtic.mil/doctrine/dod_dictionary. Accessed January 2013).

³ "About USTRANSCOM," n.d., <http://www.transcom.mil/about/cocom.cfm>., accessed January 2013.

Analogous capabilities exist in the naval domain and are proposed in the space domain. The maritime community utilizes the Voluntary Intermodal Sealift Agreement (VISA)⁴, Maritime Security Program (MSP)⁵ and Ready Reserve Force (RRF) programs.⁶ The VISA and MSP programs are modeled after CRAF and use commercial shipping companies.⁷ The RRF program was initiated in 1976 and currently has 49 government-owned ships for rapid worldwide deployment before commercial vessels are available.⁸ In papers published by Air Force and Army senior service schools, a USAF officer proposed SpaceCRAF to augment DOD space needs in a national emergency, and an Army officer proposed the Civilian Reserve Intelligence Program (CRIP) to leverage existing commercial capabilities.⁹

Cost, Risk and Continuation

Despite having differing objectives, the USAF and commercial carriers have been able to successfully reach their goals by managing independent cost and risk factors. The AF's utilization of CRAF reflects an economic decision to contract with commercial companies to provide airlift capability essential for DOD operations – combat and peacetime, stateside and worldwide. The continued airline participation indicates the risk of formal CRAF authorization has been offset by profitable peacetime contracts. A 1994 study estimated that if DOD were required to recreate CRAF capability with organic military aircraft it would have cost \$1-\$3B annually over the previous 30 years.¹⁰ The military airlift capability must be robust enough to handle missions in

⁴ “Voluntary Intermodal Sealift Agreement (VISA),” n.d., http://www.marad.dot.gov/ships_shipping_landing_page/national_security/vol_intermodal_sealift_agreement/vol_intermodal_sealift_agreement.htm, accessed January 2, 2013.

⁵ “Maritime Security Program (MSP),” n.d., http://www.marad.dot.gov/ships_shipping_landing_page/national_security/maritime_security_program/maritime_security_program.htm, accessed January 2, 2013.

⁶ The mobility triad consists of airlift, sealift and prepositioning (Miller, 428). An example from Lt Col Herron highlights the benefit of the triad. “If every C-5 flew dedicated support to movement of an Army heavy armored Corps, weighing approximately 1 million tons, and no sorties were lost, it would still take 66 days to move the unit contrasted with a sail time to Kuwait of less than 45 days. (J W Herron, “Future Airlift Requirements” (DTIC Document, 2005), 5.

⁷ Schauber substantiates his claim that “While there are similarities, they are superficial.” Donald M Jr. Schauber, “Impact of Foreign Ownership on the Civil Reserve Air Fleet” no. 42 (2008).

⁸ “The Maritime Administration’s Ready Reserve Force,” n.d., http://www.marad.dot.gov/ships_shipping_landing_page/national_security/ship_operations/ready_reserve_force/ready_reserve_force.htm, accessed 18 Jan 2013.

⁹ David C Arnold, “SpaceCRAF : A Civil Reserve Air Fleet For Space-Based Capabilities By” (United States Army War College, 2011). A similar paper by David Arnold and Peter Hays was published in the Joint Forces Quarterly, issue 64, 1st quarter 2012 (http://www.ndu.edu/press/lib/pdf/jfq-64/JFQ-64_30-39_Arnold-Hays.pdf). David W Tohn, *Civilian Reserve Intelligence Program : A Fundamental Requirement for Army Intelligence Transformation* (Fort Leavenworth, Kansas, 2003).

¹⁰S Conway, “Scale-free Networks and Commercial Air Carrier Transportation in the United States,” in *24th Congress of the International Council of the Aeronautical Sciences*, vol. 29, 2004, 7.

hostile airspace when commercial carriers are contracted to transport personnel and cargo outside hostile environments. The American commercial airline industry must continue to find CRAF profitable in a less regulated, increasingly competitive international market to continue voluntary participation.

Origins

CRAF resulted from the US being ill prepared for the airlift needed after Pearl Harbor. A brief summary of airplane and airlift history will illustrate the American situation at the start of World War II (WWII).

Airplane design progressed in less than three decades from planes barely capable of carrying the pilot aloft to operational military transportation aircraft with multi-ton payloads. The first sustained and controlled heavier-than-air powered flight occurred in 1903. The American isolationist reaction to WWI resulted in minimal military expenditures in the interwar years, which slowed innovation and development of military transportation aircraft.¹¹ In 1926 the Air Corps' proposed five-year plan called for 158 cargo planes out of 3580 total requested planes. As of June 30, 1929 the Corps only had 31 cargo planes and 10 on order due to Congressional funding delays.¹²

President Roosevelt's December 13, 1940 executive order based on a 1936 plan allowed the Secretary of War to take possession of any civil aviation system necessary for the war effort. Contracts were successfully used with all major civil air carriers for aircraft ferrying and air transportation services. In May 1941 the Air Corps accepted sixty one four-engine C-54s originally ordered by civilian airlines.¹³ According to an official Headquarters Mobility Air Command (HQ MAC) report in 1968, approximately 85% of war-related airlift was accomplished by civilian airlines. "Commercial aircraft flew hundreds of missions and made significant contributions throughout World War II. Commercial transports flew military missions during the Berlin Crisis in 1948-49 when airlift was the only available means of delivering food and supplies

Referenced the Lois J. Batchelder and Katherine M. Poehlmann Gebman, Jean R., *Finding the Right Mix of Military and Civil Airlift, Issues and Implications: Volume 2. Analysis* (Santa Monica, CA, 1994).

¹¹ In 1920, Congress only provided 1/3rd of the requested funds for the Air Service, resulting in the Director of the Air Service stating "not a dollar is available for the purchase of new aircraft." (Charles E. Miller, *Airlift Doctrine* (Maxwell Air Force Base, Alabama: Air University Press, n.d.), 2.) There were considerable strides in the development of civilian transport planes (Ford Tri-Motor, Boeing 247, Douglas DC-2 and 3).

¹² Miller, *Airlift Doctrine*, 3-4.

¹³ Miller, *Airlift Doctrine*, 21, 31.

to West Berlin.”¹⁴ The Ignatius report stated that during the Berlin crisis, over 600 commercial flights to Europe were accomplished, and approximately 10% of flights into Berlin.¹⁵

President Truman signed an executive order on March 2, 1951 which “authorized the Secretary of Commerce to transfer or assign civil air carriers to the Department of Defense during mobilization.” After coordination with the airlines, on December 15, 1951, the Secretaries of Commerce and Defense signed the Civil Reserve Air Fleet Plan. The plan stated airlines would provide ninety-one aircraft to the Military Air Transport Service (MATS), a precursor to Air Mobility Command, within forty-eight hours of notification, with an additional 271 aircraft 30 days later.¹⁶

Contract Structure

CRAF is a contract for planes and aircrew. To participate in CRAF, carriers must commit a minimum of 30% of its CRAF capable passenger fleet and 15% of its CRAF capable cargo fleet, along with at least four complete crews for each aircraft.¹⁷ The contract is renewed annually.¹⁸ Carriers are allowed to update their aircraft availability and specify particular aircraft tail numbers. Airlines are paid for personnel on a per-person per-mile basis, and for cargo per-pound per-mile.¹⁹ “Carriers’ decision to participate in CRAF is based on an economic decision, balancing risks associated with activation with peacetime incentives. No subsidies are provided to CRAF carriers.”²⁰

¹⁴ Mary Chenoweth, *The Civil Reserve Air Fleet: An Example of the Use of Commercial Assets to Expand Military Capabilities During Contingencies* (Santa Monica, CA: RAND, 1990).

¹⁵ Paul R Ignatius “Let Airlines Plan an Optimum Role in Supporting National Defense,” Defense Management Journal, Apr 1975, 11-12.

¹⁶ Ned Preston, “FAA Historical Chronology, 1926-1996,” n.d., <http://www.faa.gov/about/media/b-chron.pdf>.

¹⁷ There are two details to note. First, there exists a process for companies with aircraft that do not meet CRAF requirements to request waivers so they can compete for USG contracts that require CRAF participation. (“Civil Reserve Air Fleet,” n.d., <http://www.amc.af.mil/library/factsheets/factsheet.asp?id=234>., accessed 18 Jan 2013). Second, the contract was amended to reflect the impact of airline employees serving in the guard and reserve. Because guard and reserve crew members might be called to military service, they are not eligible towards the 4 crew minimum. A review of the literature and regulations did not uncover any limitation for guard or reserve members regardless of role, pilot or other support, from participating in CRAF missions in their civilian employment capacity. While it has since changed, “In the unlikely absence of willingness to respond, however, Title 10 US Code 9742 provides for the assumption of control of transportation assets (air included) by the president in time of war. The MAC office of the Staff Judge Advocate has concluded that the Title 10 provision is legal basis for obligatory performance by CRAF crewmembers.” (“Personal Responsiveness to CRAF Activation and Directives,” pg 42 of MS025-79 Letter from MAC Staff Judge Advocate to MAC Civil Air Division, August 14, 1974, pg 1)

¹⁸ “Headquarters Air Mobility Command: Command Brief” (Scott AFB, IL, 2012), 32.

¹⁹ Jerry D. Harris Jr, “Civilian Reserve Air Fleet: Should the USAF Use It Routinely?” (1997), 20.

²⁰ “Headquarters Air Mobility Command: Command Brief,” 32.

The CRAF has three segments – international, national and aeromedical evacuation. The international segment is split into long-range and short-range sections. The national segment is split into domestic and Alaskan sections.

The long range international segment augments AMC's long-range intertheater C-5s and C-17s with aircraft that have a minimum 3500 nautical mile range. The short-range international segment handles shorter flights.²¹ While any AF mobility aircraft can be configured to execute the aeromedical evacuation (AE) mission, the CRAF AE segment uses B-767 aircraft with government provided kits creating air ambulances.²²

In addition, the CRAF contract has three distinct stages based on the scale of the emergency that determine how many aircraft are required. All three stages have the same approval process. The USTRANSCOM Commander sends a request to activate to the Secretary of Defense (SECDEF). Upon approval, USTRANSCOM implements the plan and AMC as the air component directs the activation to the carriers via classified message.²³ The stages are grouped according to the increasing size of the emergency. Stage I suffices for minor operations, while Stage II is appropriate for a major theater war requiring rapid deployment. Stage III is designed to augment more than one major theater war at the same time or operate in a larger crisis. Through April 2013, Stages I and II have been authorized twice and once, respectively, while the third stage has never been authorized.²⁴

Policy Changes

The US Airlift policy was highly contested between 1953 and 1965 as the civilian airline industry and military fought to define their peacetime and wartime roles and funding. For example, one private sector proposal included the airlines handling all military airlift requirements.²⁵ In September 1957 MATS was designated the Single Manager Operating Agency for Airlift Service, a prelude to USTRANSCOM's role today.²⁶

The National Security Directive Decision (NSDD) 280 National Airlift Policy, implemented in June 1987, reaffirmed CRAF's significance and the commercial air carrier's role.

²¹ *Issues Regarding the Current and Future Use of the Civil Reserve Air Fleet* (Washington, D.C., 2007), 2.

²² HQ AMC/A3BC, *Headquarters Air Mobility Command Civil Reserve Air Fleet (CRAF) 101*, n.d., 7.

²³ HQ AMC/A3BC, "Headquarters Air Mobility Command Civil Reserve Air Fleet (CRAF) 101, 8.

²⁴ *Issues Regarding the Current and Future Use of the Civil Reserve Air Fleet*, 2.

²⁵ Miller, *Airlift Doctrine*, 235–290.

²⁶ MATS is the predecessor to Military Airlift Command (MAC), which was reorganized and redesignated as Air Mobility Command (AMC).

“During peacetime, DOD requirements for passenger and/or cargo airlift augmentation shall be satisfied by the procurement of airlift from commercial air carriers participating in the CRAF program, to the extent that the DOD determines that such airlift is suitable and responsive to the military requirement. Consistent with the requirement to maintain the proficiency and operational readiness of organic military airlift, the DOD shall establish appropriate levels for peacetime cargo airlift augmentation in order to promote the effectiveness of the CRAF and provide training within the military airlift system.”²⁷ The need to be flexible changing military requirements has led to challenges discussed in the “Today – Operations and Challenges” section.

Mission Impact

Since their creation, US airlines have supported the American military in all major military operations including WWII, Korea, Vietnam, Desert Storm, and Operation Iraqi Freedom (OIF). “In the Korean War, CRAF moved 67 percent of the passengers and 56 percent of the cargo. Civil aircraft also moved over 11 million passengers and 1.3 million tons of cargo during the Vietnam conflict without activation of any stage of CRAF.”^{28,29} The CRAF program, however, was only formally authorized during Desert Storm and OIF. While the following section attempts to be comprehensive, it reflects that much of the available history and data are focused on events particular to those two operations.

Operation Desert Storm

The first activation of CRAF occurred on 17 August 1990 when Stage I long-range international passenger and cargo aircraft supported Operation Desert Shield. Due in part to the productive informal discussions between DOD and its commercial partners about the impact on civilian Christmas travelers, Stage II was activated in January.³⁰ After the Stage II activation on January 17, 1991, there were discussions of a Stage III activation of an additional 25 to 30 long-range international cargo aircraft. The TRANSCOM leadership and the Joint Staff agreed not to

²⁷ Peacetime refers to geographic location of particular aircraft, as opposed to combat flights Flynn, “Testimony,” n.d., 7, <http://republicans.transportation.house.gov/Media/file/TestimonyAviation/2009-05-13-Flynn.pdf>.

²⁸ Schauer, “Impact of Foreign Ownership on the Civil Reserve Air Fleet.”; Congressional Budget Office, *Moving U.S. Forces: Options for Strategic Mobility*, n.d., 85.

²⁹ While the Boeing 747-121 not flying on a USG-contracted flight, on December 1988 Pan-Am Flight 103 was destroyed in flight by a bomb over Lockerbie, Scotland. The aircraft was modified for CRAF use so “the aircraft to be quickly converted for carriage of military freight containers on the main deck during times of national emergency.” John Barry Smith, *Aircraft Accident Report Pan Am Flight 103 Part I Consideration of Reasonable Probable Causes*, n.d., 269.

³⁰ The available literature did not discuss if the formal activation in January was a mutually agreed upon decision, or if the airlines were unwilling to voluntarily meet all of the DOD requirements. Being confirmed

proceed for the primary reason of the negative impact to the commercial airline industry, causing CENTCOM to adjust plans for a slower deployment phase.³¹ Stage II was deactivated on May 17 followed by Stage I seven days later. Twenty-seven carriers executed 5,441 CRAF missions, carrying 709,000 people and 126,000 tons of equipment and supplies.³² The CRAF handled 21% of the flights including 64% of the passengers and 27% of the cargo during deployment from the US. During the redeployment, CRAF handled 84% of the passengers and 40% of the cargo.³³

While the US sought donations of airlift capability from other countries, some wanted to be reimbursed for airlift at rates higher than CRAF. The Government Accountability Office (GAO) reports some countries' contributions, including Japan, placed restrictions on their small donation limiting airlift to not transport ammunition.³⁴

The Desert Express, a C-141 overnight delivery service for specified high priority, critical spare parts and medical supplies from Charleston Air Force Base, South Carolina, to Dhahran and Riyadh, Saudi Arabia, was a successful improvisation to accommodate small, high-priority items. Commercial express companies transported the items to Charleston, and no participation in CRAF was required.³⁵

Operation Iraqi Freedom

The Stage I long-range international passenger airplanes were activated on 8 February 2003 completing 1,625 missions and transporting 254,143 troops.³⁶ While it was not a CRAF plane, a commercial Belgian-flagged DHL aircraft under control of a British and Belgian crew was hit by a Man-Portable Air Defense System (MANPAD) on November 22, 2003, highlighting the risk of using civilian airplanes in a hostile area.³⁷ Airlift was not the only source of mobility for this operation, as there was "a commercial hub with a seaport for debarkation and prepositioned equipment."³⁸

³¹ *Changes Underway to Ensure Continued Success of Civil Reserve Air Fleet* (Washington, D.C., 1992), 22..

³² Preston, "FAA Historical Chronology, 1926-1996."

³³ *Civil Reserve Air Fleet (CRAF) Study Report*. (Arlington, VA, 2008), 14.

³⁴ "How GAO Built Its Dream House," n.d. From its origination in 1922 until July 6, 2004, GAO stood for Government Accounting Office. The Budget and Accounting Act of 192 x, which transferred auditing responsibilities, accounting, and claims functions from the Treasury Department, created it.

³⁵ *Operation Desert Storm: The Services' Efforts to Provide Logistics Support for Selected Weapon Systems: Report to the Chairman, Committee on Armed Services, House of Representatives* (Washington, D.C.: GAO, 1991), 28–30.

³⁶ "Civil Reserve Air Fleet Stage 1 Activation Announced," n.d.

³⁷ David Hughes and Michael A. Dornheim, "DHL/EAT Crew Lands A300 With No Hydraulics After Being Hit By Missile," *Aviation Week & Space Technology*, 8 December 2003.

³⁸ Glen Downing, *Missile Defensive Systems and the Civil Reserve Air Fleet* (Maxwell AFB, 2009), 9.

Highlights Outside Desert Storm and OIF

As of June 2007, there were 73 aircraft allocated to Stage I, 304 to Stage II and 1363 to Stage III.³⁹

Existing information reveals only one use of CRAF airplanes in a formal exercise. In January 2002, Guard, Reserve and active duty Airmen participated in an 11 day, six-stop Aeromedical Evacuation Civil Reserve Air Fleet exercise.⁴⁰

Today – Operations and Challenges

Business Model

The airlines' business model has changed since CRAF's creation. While the partnership between government and industry has been successful, there are challenges that cannot be ignored.

As previously discussed, CRAF was designed to be a 'surge' capability, and has transitioned into a 'steady-state and surge' capability. Since its creation, the peacetime requirements have grown. Some companies intentionally make peacetime CRAF work a significant part of their business model. Other companies choose to participate in CRAF contractually, yet re-sell their CRAF flights.

The combined impacts of deregulation and corporate financing require predictability in the "fixed buy" and "expansion buy" for private sector investors. Fixed buys are set contracts for "channel flights" made regularly from the continental US on Atlantic and Pacific routes. Expansion buys are after fixed buys and provide airlift to support exercises, contingencies, special airlift assignment missions and growth in channel requirements.⁴¹ "The 2003 [Institute for Defense Analyses (IDA)] study recommended DOD commit to better forecasting and scheduling and develop a concept of employment that utilizes the most efficient aircraft for the long distance high-density cargo requirements for which they are best suited. The current "business as usual" approach and scheduling process must be reengineered consistent with the 2009 NDAA "assured business" language allocating a greater number of hours to CRAF."⁴²

The Airline Regulation Act of 1978⁴³ and the advent of low cost carriers such as Southwest Airlines and Jet Blue have reduced the previously high profit margins. International ownership is

³⁹ *Issues Regarding the Current and Future Use of the Civil Reserve Air Fleet.*

⁴⁰ James C. Dillard, "CRAF Exercise Includes Stops at Six Bases Across United States," n.d., http://airforcemedicine.afms.mil/sg_newswire/feb_02/CRAF_real.htm.

⁴¹ *Military Readiness: Civil Reserve Air Fleet Can Respond as Planned, but Incentives May Need Revamping* (Washington DC, December 2002), 15..

⁴² Flynn, "Testimony," 7-8.

⁴³ "A Brief History of the FAA," n.d., http://www.faa.gov/about/history/brief_history/.

becoming increasingly common and a growing challenge for US airlines. Because of the desire to have a voluntary and productive relationship, backed up with an enforceable contract, the USG has a strong preference to use US based carriers.

Risk

A risk decision the USAF makes when building plans dependent on CRAF is that commercial planes are neither designed nor manufactured to operate in the same hostile environments as military planes. Thus, this limitation needs to be understood by decision makers and planners alike, as there are complex and long lasting impacts. Counter-surface to air missile (SAM) capabilities can be added to CRAF planes.⁴⁴ Cargo transported by commercial planes needs to be unloaded closer to the destination, and reloaded into military airlift for final delivery to hostile areas.⁴⁵ Additionally, FAA rules are applicable for standard commercial and CRAF flights, including those that prohibit flights to specific locations, but waivers can be obtained.⁴⁶ Another trade-off to consider is the military's interest in transport aircraft that can operate in more primitive landing facilities with shorter runways and minimal instrumentation.⁴⁷

Conclusion

The CRAF has been a successful example of the USAF partnering with industry to meet its stated peacetime and wartime capabilities in a cost effective manner. The risk has been successfully identified and managed, allowing combatant commanders (CCDRs) to have the necessary airlift to accomplish their mission. CRAF is an example of the benefits that can result when the government can clearly articulate its needs. Chapter Five provides a contrast with the ambiguous and maturing cyber requirements.

⁴⁴ Downing discussed four options in his report published by AU Press, The Maxwell Papers AWC #45, 14-21.

⁴⁵ *KC-X: The Next Mobility Platform: The Need for a Flexible Tanker* (Scott AFB, IL, 2007), 5.

⁴⁶ For example, the FAA prohibited flights to Iraq.

⁴⁷ *Managing Materials for a Twenty-first Century Military* (The National Academies Press, 2008), 169.

Chapter 5

Analysis

The Air Reserve Component has an opportunity to contribute to national defense and USAF cyber operations in ways unavailable to previous generations of Guard and Reserve members. This chapter leverages the three inter-related key variables of cost, risk and culture to analyze the two historical analogies (OSS and CRAF); this process will help inform today's AF and ARC leaders.¹ While this discussion is focused on the two air reserve component organizations, the ideas might apply to varying degrees to the other five reserve components and to lesser degrees to civilian reserves for other departments, including the proposed Department of Homeland Security (DHS) Cyber Reserve.

Each of the key variables has its own section with a similar structure. After a brief introduction, the similarities and differences between the two historical analogies and today's cyberspace enterprise will set up the analysis of the role of ARC Airmen, particularly those serving part-time.

Cost

Since the colonial era, cost has been one of several key factors in military policy debates. In the cyber enterprise cost is a substantial but overemphasized factor in the argument for the ARC role. The cyber-related skills developed and maintained during civilian employment are the competitive advantage. The National Guard (NG) has unique authorities, both federal and state funded, that provide it more opportunities than federal forces.² In addition, the AF can leverage the experience and skills of its ARC members that are not available in its AC. The premise of an auxiliary or reserve is that paying for occasional surge support is less expensive than having an equally trained full time unit.³ As RC personnel from all services were used more

¹ This thesis does not provide specific policy recommendations because of the limited current and publicly available data regarding US Government and Department of Defense (DOD) priorities.

² NDAA 2013 provides AF Reserve Command and other reserve components new authorities to respond to natural disasters or emergencies in the homeland. Law authorizes mobilizing reservists to respond to natural disasters. See <http://www.afrc.af.mil/news/story.asp?id=123302456> for additional details.

³ The author did not discover quantifiable support. This premise is “concluded” by the 2010 QDR and “most experts agree” in the CNAS’ *An Indispensable Force* document. “The 2010 QDR concluded that effective use of the National Guard and Reserves “will lower overall personnel and operating costs, better ensure the right mix and availability of equipment, provide more efficient and effective use of defense assets, and contribute to the sustainability of both the Active and Reserve components.” See Department of Defense, Quadrennial Defense, Review Report (February 2010): 53. (from CNAS Hard Choices Barno Sharp – pg 28) “Although most experts agree that making greater use of the reserve component will save money overall, they continue to debate the precise savings involved. As a result, this report’s illustrative scenarios do not include any savings generated from transferring forces to the reserve

frequently over the last twenty years, the savings decreased. While there are perils in predicting the future, force planning must be accomplished in advance. While the short-term costs are apparent, the long-term costs need to be better understood.

In addition, the AF is underutilizing the skills of some of its ARC Airmen. In business terms, the AF is getting less return on investment (ROI) than necessary. While some of this is intentional and reasonable, there appears to be latitude to increase mission impact.

In today's budget constrained environment, opportunity costs are key as the nation assumes higher risk by reducing spending on defense capabilities. After a comparison to the historic analogies, the following section looks at cost from the USAF's,⁴ members', and employers' perspectives, which are rarely all in alignment.⁵

Background

To facilitate wise fiscal decisions, the DOD is having quantitative discussions regarding short and long-term costs of its AC and RC forces, particularly operations costs and the multiple personnel categories. The distinction between cost shifting, cost savings and economies of scale is essential.⁶ The operations cost for smaller bases, regardless of component, are likely higher due to fixed costs being distributed over a smaller unit. A larger of percentage of ANG and AFR bases are smaller than AC. In early 2012, several reports were released indicating DOD senior leadership interest in another round of Base Realignment and Closure (BRAC) steps to reduce "infrastructure that is beyond our needs or ability to maintain."⁷ By August of 2012, with a presidential election two months away, the Secretary of Defense (SECDEF) admitted, "there will not be a round of BRAC authorized in 2013."⁸ The political will was not there. A November

component. For an overview of the debate, see John Nagl and Travis Sharp, *An Indispensable Force: Investing in America's National Guard and Reserves* (Washington: Center for a New American Security, September 2010): 26-27.

⁴ USAF includes the ARC's federal and state missions.

⁵ There is a multitude of other stakeholders including DOD and other executive branch along with elected officials at all levels and their constituents.

⁶ When the AF Reserve advertises that it accomplishes 17% of the AF mission on 4% of the budget, it is shifting the cost of the planes the AFR operates and the large percentage of experienced and trained personnel it gains that were funded by the active component. Cost savings are gained by improved efficiencies, possibly conditioned on certain usage rates or stopping efforts entirely. In the case of geographically dispersed ARC personnel working at Joint Reserve Intelligence Centers (JRICs), there can be economy of scale efficiencies by increasing weekend and weekday utilization, instead of having multiple facilities.

⁷ <http://www.jcs.mil/speech.aspx?ID=1678> (accessed February 24, 2013.) Secretary Panetta and General Dempsey Brief Pentagon Press on Major Budget Decisions As Delivered by Secretary Leon Panetta and General Martin E. Dempsey , Washington, DC Thursday, January 26, 2012

⁸ <http://www.military.com/daily-news/2012/08/07/hopes-dead-for-2013-brac-round.html> "Hopes Dead for 2013 BRAC Round, Panetta Concedes" Aug 07, 2012. (Accessed 24 February 24, 2013.)

2012 Government Accountability Office (GAO) report found the DOD “originally estimated saving \$2.3 billion from joint basing over 20 years, but in the absence of a plan to drive savings, that estimate has fallen by almost 90 percent.”⁹

The fully burdened costs for AD are available, and contractors are required to provide their costs as part of the proposal process, yet there is not an agreed upon method for calculating RC costs.¹⁰ The current Reserve Forces Policy Board (RFPB) recommended that DOD write a policy specifying how long-term RC personnel costs should be calculated.¹¹ The RFPB’s first recommendation to a SECDEF four-part task was to “Establish DOD policy/guidance for computing fully-burdened Military Personnel Costs for the Total Force. The Director of Cost Assessment and Program Evaluation (CAPE) should establish permanent DOD policy for calculating the ‘Fully-Burdened’ costs of individual members from both the active and reserve components.”¹² Given the current compensation, there are different long-term costs for members who: receive an ‘active duty’ retirement; receive a ‘reserve retirement’; and separate before being eligible for retirement.¹³ As ARC members are called to serve more frequently and longer it is difficult to predict how many will retire with an AD versus reserve retirement. Proposed changes to military pay, and immediate and long-term retirement benefits could alter all aspects of recruiting and retention, including when someone retires or separates.

⁹ GAO 650106 DOD Joint Bases Management efficiencies – GAO-13-134

¹⁰ Some shortcomings of in-sourcing initiatives and Directive-Type Memorandum (DTM) 09-007 “Estimating and Comparing the Full Costs of Civilian and Military Manpower and Contract Support” are discussed in David et al Berteau, *DoD Workforce Cost Realism Assessment Authors DoD Workforce Cost Realism Assessment* (Washington, D.C., 2011), 9–11.

¹¹

http://ra.defense.gov/rfpb/_documents/RFPB_Cost_Methodology_Final_Report_Slide2_12Dec2012.pdf approved December 12, 2012, accessed February 8, 2013. The long-term costs of recent operations in Iraq, Afghanistan and other locations since 2001 led to current underfunding of the Department of Veterans Affairs. The expected injuries for cyber-operations and similar military functions accomplished in an office environment in a non-deployed location are dramatically different than combat units. *Potential Costs of Veterans’ Health Care* (Washington DC, 2010).

¹² “On September 5, 2012, SECDEF met with the RFPB and asked us to provide advice and recommendations on four strategic topics: Best Ways to use the RC in the Future, AC/RC Mix, Cost of a Strong Reserve, How to Achieve Savings in Reserve Components.”

¹³ Both enlisted and officers in the AFR (need to confirm ANG) are eligible to receive retirement benefits identical to an AC Airmen (and that of any other armed service – Army, Navy, USMC). See _____ for additional details. The 1970 Gates Commission addressing the transition to an all-volunteer force made recommendations that are currently being mentioned. In particular the policies implemented in the 1970s that are still largely in effect focused on those who intended to make a career of the military, and did not address the short-term volunteers. (Todd Harrison and Mark Gunzinger, *Strategic Choices: Navigating Austerity* (Washington DC, 2012). Todd Harrison, *Rebalancing Military Compensation* (Washington DC, 2012), 2-3.) In this thesis, medical retirements would be included under active duty retirements.

Often the ARC member must balance responsibilities between family, civilian employer and USAF. This balancing includes tradeoffs in time and economic factors.¹⁴ Since the civilian employer provides the majority of the income for the part-time reservist, the member needs to manage the impact of continued ARC duty (both individually and from his or her employer's perspective). While there are federal laws, including the Uniformed Service Employment and Reemployment Rights Act, protecting a military member's civilian job, members' experiences can vary widely. Unlike the CRAF model where the distinction between government and commercial service is negligible to the employee, there can be significant economic risks for employers and ARC members in the part-time model.¹⁵

While the DOD has a reasonable monopsony on certain military occupations, the ARC brings members earning significantly more for doing similar work in their day jobs than in the ARC position.¹⁶ There are existing studies on AC and RC pay compared to their civilian counterparts with various results. A seldom-discussed viewpoint is the value the DOD and the services are receiving by some of its ARC members in the cyber mission.¹⁷

In today's knowledge economy, there need to be different measures of effectiveness than productivity. While the numbers are subjective, the principle applies. ROI calculations for financial investments are straightforward. The AC can leverage the expertise developed over years in the commercial sector with someone else paying the salary and benefits.¹⁸ There is anecdotal data regarding the salaries of some cyber Airmen compared to their AF pay. This research mentions the pay discrepancy issue only to demonstrate the value for the USAF, rather than as a call for higher military salaries.¹⁹ If the AF chooses to view its ARC Airmen as

¹⁴ Lt. Gen. Charles E. Stenner Jr. (ret) was Chief of Air Force Reserve, Headquarters US Air Force, Washington, D.C., and Commander, Air Force Reserve Command, Robins Air Force Base, Ga from June 2008 until July 2012. He frequently used his three legged stool analogy. The Chief of Air Force Reserve serves as principal adviser on Reserve matters to the Air Force Chief of Staff. The Commander of Air Force Reserve Command has full responsibility for the supervision of all US Air Force Reserve units around the world. (<http://www.afrc.af.mil/news/story.asp?id=123296904>, accessed 8 Feb 13; <http://www.af.mil/information/bios/bio.asp?bioID=7710> accessed 8 Feb 13).

¹⁵ *The Effects of Reserve Call-Ups on Civilian Employers* (Washington DC, May 2005), 12–19.

¹⁶ For example, the US Government and its approved contractors have a lock on certain skills such as fighter pilots.

¹⁷ During multiple interviews antidotal evidence gathered indicates multiple units have NCOs and CGOs earning at least \$150K in the civilian jobs, and serving in uniform as E-5s to O-3s. Depending upon the opportunity for the member to use their skills, the USG and USAF have the potential for significantly increased ROI.

¹⁸ A possible way to measure value would be ROMPA-S / ROMPA-L (Return on Military Pay and Allowance – Short / Long term. While it would be improper to get members actual salaries, publicly available averages for specific categories could enable quantifiable analysis.

¹⁹ The value of other retirement benefits and intangibles also inspires service. While researchers indicate younger members, both officer and enlisted, do not value the retirement benefits at their actual

interchangeable with AC peers, they are not using all available expertise.²⁰ For example, a 35-year-old Staff Sergeant or Lieutenant provides a different perspective to their military responsibilities than their typical AC peer.

The current Joint Federal Travel Regulations (JFTR) can lead to significant costs when the ARC member's duty location is far enough away from their home. As a result, some units, both IMA and TR, have "local hire only" policies to reduce costs when members serve days beyond their required minimums.²¹

The AF decided to invest heavily in training for its new cyber officers. The required six-month Undergraduate Cyber Training (UCT) course is required to be awarded the title of cyberspace officer (e.g. AFSC 17D1). This is clearly a greater requirement than the one given to the initial officers grandfathered into the field, who simply had to accomplish an online course with multiple choice answer tests.²² A goal with the required UCT and technical course requirements in the Air Force Officer Classification Directory (AFOCD) was to improve the technical competence of the cyber force, after formerly having no technical formal education requirements for entry. An unstated impact is that it limits the cross flow from other career fields in the ARC, especially at the senior officer ranks of Lt Col and Colonel. A counterproductive consequence is that highly skilled ARC members with civilian employment might not find the tradeoff beneficial to attend the six-month training course compared to performing mission for the AF or working their civilian employment.²³

Another aspect in the maturation of DOD cyber personnel is highlighted for training versus education provided. The difference in capability is significant. Training is about mastering a skill, while education is about "fostering the mind" and critical thinking about a subject.²⁴ All officers, regardless of AFSC, have formal, grade-specific professional military education requirements. While the DOD often funds its civilians and military members completing academic programs at civilian institutions, it only has required training courses for its cyber operators. In other words, the required AF and joint cyber courses provide training and not education.

costs, the available research did not address the impact of changing retirement benefits on the advice given by older military members, veterans and civilians.

²⁰ Anonymous interviewees provide anecdotal evidence of USAF acquiring those same skills via contractors at higher costs or creating work-arounds and less efficient solutions.

²¹ While the ease and cost of travel were dramatically different, early Reserve documents also reference location restrictions.

²² The computer-based training was officially listed as a 40-hour course.

²³ The Reserve has not approved any waivers for receiving the 17D 1 without attending UCT. In light of Manseur Olson's insight that organizations exist for two purposes, their formal purpose and to continue their existence, the training requirement appears to support both purposes.

²⁴ [http://philosophynow.org/issues/47/Education_versus_Training. \(Accessed April 3, 2013\)](http://philosophynow.org/issues/47/Education_versus_Training. (Accessed April 3, 2013))

The AF has a massive challenge in leveraging the cyber-related skills of ARC Airmen. First, AF human resource (HR) systems do not track individual cyber skill sets at a granular enough level. In the case of the active component, this is not as critical as it is in the ARC. This is because the AC plans for members to work in cyber-related billets for years at a time (in other words, they plan to grow cyber expertise in its members in a ‘generalist’ manner). The requirement for the RC is much different however, particularly if members are chosen for specific tasks over shorter periods. In essence then, it becomes extremely difficult to match qualified ARC members to a particular mission need. On the unit side, then, it also becomes difficult for units to request specific skill sets in potential augmentees.

The ARC does not have an accurate, accessible repository of its members’ militarily-useful cyber-related skills, yet there are several related programs the AF could leverage when it decides to address this capability gap. The DOD has successfully captured the language skills of its military members. The AF has incentivized AC and ARC to share their language skills through the Foreign Language Proficiency Play (FLPP) based on the DOD-created, maintained and quantifiable Defense Language Proficiency Test (DLPT). Members can earn up to up to an additional \$1K/month. The AF Reserve Development Plan (RDP) is a database used for force development and other actions.²⁵ The system that houses AF performance reports has some useful information too. While officer and enlisted evaluations capture accomplishments, the duty titles are available for query but not the content provided by the rater and additional rater. The Air Force Institute of Technology (AFIT) manages the system of record for AC and RC Airmen civilian education degrees. The Civilian Employer Information (CEI) database was a result of a 2002 report that recommended the DOD needs a “comprehensive manpower and personnel strategy that draws upon a mix of measurable skills, experiences, and accomplishments that are both military and civilian.²⁶

Historical Analogies

During WWII the nation accepted government intervention in the markets to enable wartime mobilization. The Departments of War and Navy focused on overcoming temporary

²⁵ RDP is the reserve implementation of the Airmen Development Plan (ADP).

²⁶ The CEI is unavailable as of March 2013 and a new version is being tested. The CEI that went off-line had very stringent rules for releasing the information, eliminating it as an effective option for the needs discussed in this thesis. Office of the Assistant Secretary of Defense for Reserve Affairs, “Reserve Component Civilian Occupation Information Final Report: DOD Actions Needed to Better Manage Reserve Component Civilian Occupation Information,” December 2002, iv. <http://www.defense.gov/News/NewsArticle.aspx?ID=26978>; <http://ra.defense.gov/programs/cei/>; <http://ra.defense.gov/documents/main/CEIChu.pdf>.

shortages to win the war, not the long-term costs. As discussed in Chapter Three the OSS was able to flex existing government personnel rules to hire based on competence and not seniority, as was accepted practice. In addition, they could pay competitive salaries for its civilians. The long-term costs of government civilian and military retirement were not significant drivers.²⁷

The successful Civil Reserve Air Fleet (CRAF) program demonstrates the AC can accomplish its mission by partnering with non-AC organizations when it is able to fill a capability gap, in this case airlift, in an economically viable manner. The USAF and its commercial partners have been able to balance their short and long-term economic interests well enough to continue the relationship for over sixty years, through smooth and turbulent times. In the CRAF the government is contracting for the airplanes, pilots and support. The USAF assumed no long-term liability to the airlines, including pension and health care. The US Government has successfully leveraged its purchasing power to create meaningful incentives for the US carriers to participate.²⁸ The program has adapted to various changes over the years, including deregulation in the late 1970s and the ongoing international consolidation.

Cyber Enterprise

In the ongoing budget discussions tough decisions are being made regarding the short and long-term opportunity costs. Personnel costs compete with modernization and readiness costs, among other categories. The discussions during 2012 regarding AC and RC end strength highlight the political aspects of military funding and serve as a reminder of civilian leadership's oversight of the military.

Within the existing budget and end strength, there is some discretion regarding allocation of its fiscal resources and personnel to the cyber mission. Based on the Fiscal Year 2013 National Defense Authorization Act (NDAA), the Secretary and Chief of Staff of the AF (SECAF and CSAF) created a Total Force Task Force (TF2). The TF2 will "create an enduring strategic process to determine how to correctly balance the strengths of each component to sustain capabilities required to defend our nation now and into the future."²⁹ In new Total Force Enterprise (TFE) processes executed at the SECAF staff level, senior leaders are provided multiple force mix options within a given mission set. The Air Force Strategic Planning office

²⁷ http://www.law.umaryland.edu/marshall/crsreports/crsdocuments/98-1006_F.pdf, accessed March 8, 2013 CRS Report for Congress Received through the CRS Web Order Code 98-1006 F Military Health Care: The Issue of "Promised" Benefits Updated August 12, 2003

²⁸ Voluntary must be qualified as the DOD has the authority in an extreme emergency to seize aircraft and other privately owned property.

²⁹ <http://www.af.mil/news/story.asp?id=123342027> accessed May 1, 2013.

receives objective data, including present year cost, for each study. The senior leaders have flexibility to include intangibles like political viability when determining the force mix.

The existing personnel policies and support systems could better enable the AF to meet its ‘organize, train and equip’ responsibilities to Combatant Commanders (CCMDs) for planning and execution, along with service operations. While additional funds will eventually be needed for Human Capital Management (HCM) system improvements, personnel policies must acknowledge that changes in requirements are expected and need to be built into policies, procedures and requirements for Information Technology (IT) systems improvements.³⁰ Given the range of civilian and government organizations involved, it would be effective to work towards creating and using accepted terminology and interchangeable data.

In addition to billet management policies, current approaches to ‘location independent’ working could decrease costs and improve mission effectiveness. Existing telecommute approval processes are cumbersome and limit use. While telecommuting is formally defined as “a management tool that allows the [USAF] to authorize reservists to work/train away from their official duty location,” there are other procedures if a supervisor wants a reservist to work at a military facility other than the official duty location.³¹

Risk

One of the responsibilities of a military commander is to manage risk associated with accomplishing the unit objective.³² After a short background discussion, the historic analogies provide insights into various types of risk. The cyber section will look at the risk from the AF’s, employers’ and ARC Airmen’s perspectives.

Background

Given all the uncertainty in war and military operations, commanders like to reduce unnecessary risk. This thesis uses Glyn Holden’s two aspects of risk – uncertainty about potential outcomes and utility of the outcomes. Since there are many sources of fog and friction already inherent in military operations, leaders are loath to introduce unnecessary risk intentionally. Commanders make trade-offs due to resource constraints, even under the most generous of

³⁰ Rick Dove, *Response Ability: The Language, Structure, and Culture of the Agile Enterprise* (Wiley, 2002).

³¹ Air Force Instruction (AFI) 36-2254, Volume 3, *Reserve Personnel Telecommuting/Advanced Distributed Learning (ADL) Guidelines*, 18 June 2010.

³² Risk is, per DOD, “probability and severity of loss linked to hazards.” (JP 5-0) Hazard is, per DOD, “a condition with the potential to cause injury, illness, or death of personnel; damage to or loss of equipment or property; or mission degradation.” (JP 3-33)

perceived budgetary surpluses. The DOD and the services created many efforts associated with risk management from individual members and teams (e.g., Operational Risk Management (ORM)) to DOD major acquisitions. This thesis intentionally uses a definition that is applicable in many areas because it is most appropriate for many different risks discussed later in this section.

The peacetime military focuses on efficiency while in war the military cares about effectiveness. In *The Efficiency Paradox: How Hyperefficiency Can Become the Enemy of Victory in War* Geoffrey Weise addressed risk through the familiar lens of effectiveness and efficiency. Lt Col Weiss' efficiency paradox is “the apparent contradiction that occurs when maximizing efficiency actually results in diminished effectiveness.” He defines hyperefficiency as “a condition whereby maximizing efficiency becomes the central aim of an endeavor.”³³

Historic Analogies

During the OSS’ short existence, which occurred mostly during wartime, there were several categories of risk, discussed from the tactical to the strategic perspective. Because of the combat environment, the operational units accepted a higher risk tolerance, dependent upon the latitude provided by the conventional army commander. Detachment 101 in Burma had freedom since neither Army nor Navy commanders claimed that territory.³⁴ The personnel assigned to the operational divisions risked their lives while accomplishing their missions. There is debate regarding the impact of their sabotage and subversion because of the challenge in quantifying results.³⁵ Their actions undermined the adversary’s control and were intended to make it easier for conventional Allied forces. In Washington the OSS Director, Major General “Wild Bill” Donovan’s approach of leveraging his access to President Roosevelt was initially successful, especially in the OSS’s predecessor the Coordinator of Information (COI).³⁶ After the President’s unexpected death and the popular support for espionage faded, the OSS was disbanded at the end of WWII.

³³ Geoffrey Weiss, “The Efficiency Paradox: How Hyperefficiency Can Become the Enemy of Victory in War,” *Air* (February 2012).

³⁴ Both Army and Navy commanders ejected OSS involvement in their areas in the Pacific Theater. “OSS in Asia — Central Intelligence Agency,” n.d., <https://www.cia.gov/library/center-for-the-study-of-intelligence/csi-publications/books-and-monographs/oss/art09.htm>.

³⁵ For a discussion from the business perspective, see Nelson P Repenning and John D Sterman, “Nobody Ever Gets Credit for Fixing Problems That Never Happened,” *California Management Review* 43, no. 4 (2001): 64–88.

³⁶ Eventually a variety of influences including his bureaucratic peers in the Office of War Information (OWI) and Departments of War, Navy and State led to the OSS’s termination. See Chapter Three for additional details.

The CRAF program reflects a decision by the AF that it does not want to meet all its surge airlift requirements with military owned aircraft. It trusts that commercial carriers will follow through on their contract. Since operating costs drive commercial plane design, the AF accepts that the commercial planes are not being designed to enter combat environments. The AF has accepted the risk to their flexibility.³⁷ The commercial planes can move personnel and cargo closer to the area of responsibility (AOR), and then reload it into military cargo planes designed to survive in harsh combat environments.

Cyber Enterprise

Risk was an aspect of the colonial era military policy debates. Based on their experience with the regular British Army, many Americans viewed a standing colonial force with severe skepticism.³⁸ In addition to the original colonies not having the economic means to afford a full time military force, their identified threats could be mitigated with citizen soldiers. Their militia could respond to the threat posed to individual local towns, yet not a war with the British Army. Part of the calculus facing elected officials as they sign military appropriations is the likelihood that forces will be needed and how quickly. More importantly, the skills of the forces need to be identified. Regardless of changing technologies and perceived threats, the service allocation has been predictably divided.³⁹ There are multiple factors involved in the AC-RC force mix.

While its historic role was as a strategic reserve, the last ten years required the RC to have an increased readiness state. The former model of mobilize-train-deploy was changed to train-mobilize-deploy. This force generation model appears to be working for units that need to deploy to contribute.⁴⁰ But as stated earlier, the RC now has new opportunities to contribute to the cyber mission. Like the similarity between military airlift and commercial passenger and cargo planes, there is an even higher degree of transfer of civilian skills in some aspects of military service. The DOD has custom platforms (e.g. bombers and tanks) and skills (e.g. combat arms units) relevant for the physical war fighting domains. The source of innovation and purchasing power has shifted in the cyber domain, putting the DOD in a unique position. While

³⁷ The AF also accepts risk in its culture by not having military members maintain and fly the aircraft.

³⁸ As discussed in Chapter Two, both Jefferson and Washington had similar experiences and geography. A major difference was Washington was Commander of the professional colonial Army.

³⁹ The split is 30-30-30-10, with the Army, AF and Navy receiving thirty percent with the USMC receiving ten percent.

⁴⁰ The deterrence aspect of a force in waiting is addressed in Chapter Two, and is periphery to this thesis.

there are no panaceas to the DOD and USG's challenges in cyberspace, the RC can provide expertise to the AC.

The RC could contribute to a short to medium term partial solution to the approved USCYBERCOM (USCC) increase in military manpower. While limited data has been formally released, the USCC was granted four thousand additional billets combined from all services with no details regarding where the billets were coming from. The mixture of civilian and military billets creates several challenges including what other mission loses billets and how to recruit individuals with the requisite skills. The breakout of entry, mid and senior grade positions was not released. Given the AC's legacy of promoting from within, the Guard and Reserve could provide some of the individuals with the necessary skills and experiences to allow the AC to continue to develop future leaders.^{41, 42} If the ARC did not have enough qualified volunteers for extended full-time orders, qualified members could be recruited.⁴³ Another aspect of risk is the cost and timeliness to change direction when necessary. The ANG is currently converting some former flying units to cyber units. The AFRC has ongoing initiatives to reprogram IMA units into TR units to shift the control and cost of full time management from the AC to AFRC.

The employers are essential partners in a viable RC. While military members can bring valuable skills and perspectives to help them make a profit, the risk of extended military service can affect hiring and retention decisions, despite existing federal law. In the last decade, part-time RC members have increased their employment at all levels of government service and large companies. These types of organizations generally offer cultures and policies conducive for military service.

There are federal protections for RC members and advocacy programs to help employers. Given the changes in amount of time RC members are in uniformed service combined with the higher unemployment rates of RC members, there are proposals to change the federal law. Some of the proposals include economic incentives for hiring and/or compensation when RC members are serving extended military service.⁴⁴

Reserve members and their families also manage risk. If a part time member is severely injured independent of his military service and before he is retirement eligible, the member can be

⁴¹ A famous exception includes the airlift pilots used by Air Corps Ferrying Command.

⁴² Some of the human capital management issues were addressed in Chapter Two. In addition, retention is a challenge given the demand for skilled cyber experts in both the government and public sectors. In addition, mobilizing an RC member that is already a federal employee involved in cyber does not increase the overall number of skilled personnel.

⁴³ The new recruits could have prior military service in another specialty area, but this is not required

⁴⁴ Mathew B. Tully, Esq., "Proposals to Improve USERRA," October 2011.

separated from the service if he can no longer meet physical standards. The member is entitled to no pension or benefits, including health insurance. Ultimately these factors highlight the differences between full time and part time uniformed service with their shared and unique risks.

Culture

Culture in this thesis is best defined by "collective customs and achievements of a people" and can be influenced by everything from formal policy to organizational theory.⁴⁵ A discussion of some of the foundations of military culture will help set the stage for specific cultural influences of the OSS and CRAF. While the OSS and CRAF cultures are distinct from today's AF and popular culture, there are similarities and differences worth noting. Finally, we must examine the challenges of fusing a vibrant innovative cyber culture with a more rigid and stove-piped military mindset.

Background

In *The Generals: American Military Command from World War II* Thomas Ricks wrote, "During [WWII], top officials expected some generals to fail in combat and were prepared to remove them when that happened... When some did not work out, they were removed quick- but often given another chance in a different job."⁴⁶ General Marshall, for example, as Chief of Staff of the Army during World War II, had a habit of firing any general whose results were not exemplary. His beliefs were common for his time, that "the only thing we know is that this spot was the wrong one for the man. This does not mean that he is not the ideal man for some other job. Appointing him was my mistake, now it's up to me to find what he can do."⁴⁷ The prompt firing aspect of military culture has changed. "Relief in the US military has become so rare that, as Lt. Col. Paul Yingling noted during some of the darkest days of the Iraq war, a private who lost his rifle was now punished more than a general who lost his part of the war."⁴⁸

The part-time Airmen in the ARC have a wide variety of motivations that impact their decision to join, remain, and leave.⁴⁹ For example, AC Airmen planning on separating from the service who have a top secret clearance can join the ARC and keep their clearance current for potential civilian employment opportunities. While patriotism and camaraderie are frequent

⁴⁵ <http://www.etymonline.com/index.php?term=culture>, accessed May 15, 2013.

⁴⁶ Thomas E. Ricks, *The Generals: American Military Command from World War II to Today* (New York: Penguin Press, 2012), 8.

⁴⁷ Peter F. Drucker, *The Effective Executive* (New York: Harper & Row, 1967), 89–90.

⁴⁸ Ricks, *The Generals: American Military Command from World War II to Today*, 8.

⁴⁹ The amount of time for additional voluntary service can also vary based on family and employer needs.

motivations, the financial aspects are important. The differences in military pay, benefits and pension between AC and RC Airmen provide a completely different financial calculus. The financial incentives encourage many ARC Airmen to stay in until they are forced to retire based on age or the rank-dependent number of years of service.

The part time reservists bring a range of civilian expertise to their military positions, like their predecessors. Some ARC members have civilian jobs that could be considered full time training for their military positions, like their frontier colonial peers. “As long as the colonial community remained a frontier community, the part-time soldiers of its militia company were likely to be fairly competent Indian fighters no matter what occurred on training days”⁵⁰ Other reservists have civilian jobs that are not related to their military positions. The historical example is that “no reasonable man would expect farmers and tradesmen who receive military training in their spare time to be instantly ready to take the field against armies of well-trained military professionals.”⁵¹ Every ARC Airman has a unique mix of military training and civilian expertise. The challenge for leadership is not only how to ascertain and catalog that information, but also how best to maximize each individual’s unique potential.

Clausewitz addresses the role of the tactical and strategic reserve in ways that are helpful for current discussions. The chapter entitled *The Strategic Reserve* begins with the following assertion: “a reserve has two distinct purposes. One is to prolong and renew the action; the second, to counter unforeseen threats.” While prolonging the fight was important to Clausewitz, the ability to respond to the unknown was paramount. It is thus “an essential condition of strategic leadership that forces should be held in reserve according to the degree of strategic uncertainty.” Given his definition of strategy as “the use of engagement for the object of the war,”⁵² the role of a reserve is justified.

Historic Analogies

The OSS had a ‘can do’ attitude towards accomplishing the mission. Out of necessity, the OSS developed an ability to adapt to change at multiple levels – organizational, team and

⁵⁰ Weigley, *History of the United States Army*, 9. Koistinen provides a snapshot into the 1780s American culture – “The lack of permanence and tradition that characterized the line was even more exaggerated for the staff. Citizen, principally merchants, frequently serviced within the supply bureaus without formality of uniform or rank. Regardless of their status, merchants moved between civilian and military and private and public pursuits with relative ease. The state of military technology, as well as the character of the armed services, kept the soldier and citizen nearly as one during the revolutionary years. Army and navy technology was still basic and in most regards close to or the same as civilian use.” (Koistinen, *Beating Plowshares into Swords*, 34.)

⁵¹ Weigley, *History of the United States Army*, 9.

⁵² Carl von Clausewitz et al., *On War* (Princeton, N.J.: Princeton University Press, 1984), 210, 128.

individual. The organization changed frequently during its short existence and reported to different bosses with different sets of authorities and increasing number of military and civilian personnel assigned.⁵³ Given the growth in personnel combined with new missions the formal and informal working relationships changed due to re-organizations including new overseas offices. The operations units both chose to hire people for specific missions and also tailored missions to their existing personnel. The operational teams realized that headquarters taskings did not always take into account the realities of their deployed location and the politics of their assigned units. In addition, operational teams knew their missteps could lead to death. Part of the OSS mystique was that it could not tell recruits all that they were volunteering for.

Due to the contract relationship of the CRAF, AMC is not formally involved in the organizational culture of the airline and its personnel. Given the amount of coordination between the AMC/A3BC, the execution arm of USTRANSCOM's responsibility for CRAF, and the carriers, a unique organizational culture develops. In other words, a bridge over time has been built in which artifacts of each unique culture fuses together to create a new pattern of behavior. For example, increased airlift requirements have been informally resolved, reducing the number of formal activations. This culture has manifested itself in how streamlined the communications process has become.

Cyber Enterprise

A review of the brief history in Chapter Two and its authoritative sources highlights the industrial age's impact on the ARC and the military at large. Part of the challenge the Air Force is having with cyberspace can be understood through a cultural lens. ARC Airmen bring experiences from two cultures – the Air Force and the commercial cyber community. As a result of their dual experience, part-time ARC Airmen are uniquely qualified to impact AF cyber culture.

The AF culture has many aspects that lead it to embrace cyber, yet it still struggles to reconcile the differences. Of the four services the AF is perhaps best known for its technical orientation to accomplish its mission and solve problems. Airplanes, rockets, and satellites are all engineering feats that continue to push the state-of-the-art. Yet the typical pace of aircraft innovation is measured in decades. From fighters to bombers to airlift, the AF is conducting operations with planes that are designed to survive for several decades. Some planes have operated for over half a century. In the cyber arena, the military rightfully values security and

⁵³ The COI reported directly to the President, then the OSS directly to the JCS.

availability to engender trust of the information being changed during operations.⁵⁴ The commercial cyber market has different incentives.

At the heart of the commercial cyber market, profitability matters. As the field of economic security has discovered, in most markets it is within companies' best interests to release insecure products to gain early momentum and market share.⁵⁵ The hardware is expected to last two or three years before it is considered obsolete, and software has even shorter lifespans. Innovation is required. In the 'tech culture' expertise is valued above position (or rank). The commercial sector has leveraged the Government efforts, including the creation of the original computer network that led to today's Internet.⁵⁶ The DOD monopoly on innovation and engineering wizardry is gone, which creates an opportunity for the AF to create new approaches to providing for the nation's security. There are challenges for the operational, technical and acquisition communities in both the commercial sector and within the DOD.

The current Chief of Staff of the Air Force (CSAF), General Mark A Welsh III, wants to change the service-wide view of innovation. The current AF culture rewards incremental changes, yet is struggling to keep up with the pace and size of commercial sector changes. As a result the CSAF has selected innovation as one of his frequent talking points. In January 2013 he released the new vision document for the USAF. His priorities were captured in the document's title: *The World's Greatest Air Force: Powered by Airmen, Fueled by Innovation*.⁵⁷ He added a book that focused on innovation on his 2012 Reading List. In *Adapt: Why success always starts with failure*, Tim Harford highlights that individuals, not corporations, "struggle to adapt and learn and grow." Similarly, the Vice CSAF, General Larry O. Spencer, is leading the "Every Dollar Count\$" initiative soliciting "good and innovative ideas on how we can better leverage the existing dollars we have and ultimately fly, fight and win."⁵⁸ In addition to these bottom-up approaches, there continues to be a need for downward directed efforts.

⁵⁴ The AF is making efforts to leverage commercial practices and technology. For example, airlift crews are using iPads instead of paper maps.

⁵⁵ Ross Anderson's seminal work entitled *Why Information Security is Hard – An Economic Perspective* led to the creation of the field Economic Security.

⁵⁶ Mitch Waldrop, "DARPA and the Internet Revolution," *DARPA: 50 Years of Bridging the Gap* (2008): 78–85.

⁵⁷ The World's Greatest Air Force: Powered by Airmen, Fueled by Innovation., <http://www.af.mil/shared/media/document/AFD-130110-114.pdf>

⁵⁸ <http://everydollar.dodlive.mil/> (accessed May 21, 2013).

In conclusion, this chapter analyzed the ARC cyber enterprise through the lenses of cost, risk and culture. Cost needs to be measured in multiple units both fiscally and temporally. The fiscal goals of the Air Force, civilian employers, and part-time Airmen all rarely align. Being aware of friction points is necessary. Risk is unavoidable, yet understanding the context – from tactical to strategic – can increase likelihood of positive outcomes. The cultural aspect is the hardest to quantify yet is equally important. The CSAF and senior AF leaders have demonstrated their cultural priority with their recent focus on Airmen and innovation. The selected historical analogies of OSS and CRAF provide additional nuances to inform ongoing discussions. The interrelationship of these three aspects provides a strong foundation for the recommendations in Chapter Six.

Chapter 6

Recommendations

I am interested in the future because that is where I plan to spend the rest of my life.

Maj Gen Perry Smith, USAF, Retired

Like politics, strategy is the art of the possible; but few can discern what is possible.

Williamson Murray and Mark Grimsley

Victory smiles upon those who anticipate the changes in the character of war, not upon those who wait to adapt themselves after the changes occur.

Giulio Douhet

The Air National Guard (ANG) and AF Reserve have made significant contributions to the national defense, AF mission, and state responsibilities.¹ The Army and Army National Guard trace their heritage to the colonial era, in the debates between Jefferson and Washington about how to employ the force. In a similar fashion, today's policy debates regarding force mix occur between elected representatives in the legislative and executive branches at the federal and state levels; these debates are often influenced by advice given by senior military leaders.

The background chapter discussed the two significant military policy laws in American history and the DOD policy of Total Force. It could be argued that these three changes were revolutionary in scope. Today the debate about the proper response and force mix for dealing with the challenges in cyberspace might conjure up images of a fourth sweeping change. The recommendation chapter, however, does not advocate a major legislative or regulatory change. On the contrary, this chapter will provide three basic recommendations that can be implemented by AFRC and ANG leadership.

In addition, these recommendations need to be considered in light of the significant contributions the Guard and Reserve currently make to ongoing operations and to being a strategic reserve force. The ARC cyber accomplishments are significant and would require resources beyond the scope of this research. The proceeding recommendations will strengthen ARC current augmentation efforts dominated by units, including the 960th CYGP, Kansas ANG's Network Operations Support Center.

¹ The 54 National Guard can receive requirements from their Governor or equivalent in addition to the federal government. For sake of clarity, the state requirements are not explicitly mentioned every time.

Each of the three recommendations would be implemented at a different level (ARC, unit, and individual). First, the DOD needs to clarify its policy for the Reserve Component (RC) role in the CONUS based cyberspace mission and fund it appropriately. This recommendation acknowledges that the CONUS cyber mission is unique compared to the typical deployed combat and combat support missions. Second, the ARC should create elite teams that supported CCMDs and HDCS units can use to experiment with organizational response approaches. Third, ARC Airmen should utilize virtual teaming (VT) and telecommuting to contribute to operations regardless of geographic limitations. These recommendations are intended to build upon the existing and planned direction for some units within the ARC cyber enterprise.

Articulating the ARC Cyber Mission

The DOD needs to state its policy and provide appropriate funding for the Reserve Component (RC) role in CONUS-based execution of the cyberspace mission. In particular, it should specify the ARC responsibility breakdown between day-to-day mission sets (operational reserve) and contingency preparedness (strategic reserve). The Chairman of the House Armed Services Committee said in March of 2012, “The logic has been simply baffling to me: Expand our military commitments while cutting our armed forces.”² As a result of the recent significant contributions of the RC since Desert Storm, the DOD issued “Managing the Reserve Component as an Operational Force,” which formally changed the previous strategic reserve to “operational capabilities and strategic depth.”³ In the spring of 2013, military forces, both active and reserve component, were put into a tiered readiness construct because of sequestration. The ongoing fiscal instability combined with dated policy directives may be leaving the ARC ill prepared to respond to future challenges. .

While there are many bureaucratic decisions to be made, one required fundamental decision is to define the range of expected ARC cyber capabilities. This will drive decisions how to use the unique skills of ARC Airmen. The option on one end of the spectrum is based on the industrial age assumptions of our current personnel system – the RC would provide interchangeable parts, both UTCs and personnel, within AFSCs. This status quo option requires no changes to the existing policies or culture. The other end leverages the relevant, unique skills and experiences of the ARC Airmen. It is not a binary decision. The USAF needs both. In any case, the associated policy, operational employment and force management functions will need to

² Buck McKeon, “Opening Address,” n.d.

³ DOD Directive (DODD) 1200.17, *Managing the Reserve Component as an Operational Force*, 29 October 2008.

adjust to respond to changes in technology and to a clarification of DOD's role in the Government's response.

The USAF choice to develop officers as generalists with a broad range of different cyber experience has significant implications for the ARC. If it chooses, the AC can get better value by leveraging the expertise of its reserve Airmen. The role of technical expertise needs to be considered. In addition, the socially constructed expectation of skills does not necessarily correlate with rank. For example, a Staff Sergeant (SSgt) in the ARC may have responsibilities in his civilian job that mirror senior leadership responsibilities. The culturally defined position and role expectations for particular grades need to be evaluated in light of differences between the AC and RC. In other words, the DOD needs to articulate a required skill set, rather than making assumptions based on rank and position.

The DOD needs to articulate and fund its Operational Force construct for the cyber enterprise. The complementary skills and experiences ARC Airmen continue to gain enable a reverse 'technology transfer.'⁴

Cyber Engineering and Staff Expansion Teams

Combat arms units keep forces in reserve based on the uncertainty of the operation. Imagine a US Army organization in Iraq. Each company in a brigade operates with a select reserve. However, if the brigade commander needs to apply a sizable reserve force in response to an emerging challenge, he or she would need to deal with the logistical and organizational challenges of re-assigning each company's reserve forces. Applying the analogy to the cyber enterprise, this study recommends the creation of a sizable reserve unit at the brigade level. In this way, a brigade commander can employ the reserve to tackle specific issues in a timely and more streamlined manner. This flexibility is even more important considering that the cyber environment is much more difficult in terms of shortened timelines and the unpredictability of future conflicts. Continuing the analogy, the flexibility would allow the brigade commander to temporarily assign the reserve unit to a specific company for a specialized task or to stay at the brigade level to handle larger issues.

Let us now apply the analogy. What would this look like in an Air Force construct? The AFRC should organize some of its expert Airmen in the cyber enterprise into consulting-like Cyber Engineering and Staff Expansion Team (CESET) units assigned above the wing level.^{5,6}

⁴ Typical Technology Transfer programs managed by the DOD exist to commercialize DOD developed technologies.

⁵ The CESET units are modeled after a composite of existing AF organizations, including the Civil Engineering community's Staff Augmentation Team (S-Team) units.

The functional orientation of these units will enable them to contribute to the changing cyber environment and role in DOD activities.⁷ By stabilizing the non-deployed operational control (OPCON) chain, the necessary relationships can be established. The Unit Manning Document (UMD) should be constructed to enable flexibility in recruiting individuals based on their education, training and experience, not just their formal AFSCs.⁸ While the CESET should be set up in Traditional Reserve (TR) entity, the implementation plan would address what type of culture the unit should have.⁹ The fixed Unit Training Assembly (UTA) schedule would provide structure for members.¹⁰ The ability for UTAs to be accomplished like an IMA would provide maximum flexibility for meeting task requirements and each member's employment and personal responsibilities.¹¹ The type of schedule should be selected based on the commander's intent.

Viable areas for ARC part-time contributions generally have the following attributes. A high degree of transfer between the civilian and military job responsibilities enables a full time civilian position to be considered full-time training. The mission task should be important yet consistent with a reserve timeline. This enables continued support, improves esprit de corps. By selecting appropriate missions and tasks, an ARC team can provide capabilities not organically available within the AC.

The implementation plan and the initial cadre would need to be created and selected with care, as their decisions will create the initial vector for the unit. The units should use the OSS's dual approaches to hiring. Sometimes they hired uniquely qualified members and found viable missions. The alternative approach involved prioritizing particular missions and recruiting the necessary team. The implementation plan needs to be judicious when specifying the Initial and Full Operating Capabilities (IOC and FOC).¹² The IOC and FOC requirements need to be

⁶ Classified information available to CCMD and service CCs would allow them to prioritize needs and create appropriate plans for the unit's service – IDTs and AT, and any additional funded requirements could be accomplished through a fee for service model or traditional MPA/RPA pool.

⁷ There is no strong direct historical basis for Cyber S-teams in the OSS or CRAF. During the late 1930s through the end of WWII, the nation was focused on support our Allies and defending the homeland. There was no military reserve component during the war, and some civilian auxiliaries were created to provide defense of the homeland support. The OSS recruited individuals from academia, military and private and public sector for their skills – including professional, technical, linguistic and culture.

⁸ For additional information on AFSCs, see Chapter Two.

⁹ The proposed units could easily be set up with IMAs. The TR construct was selected given the current emphasis AFRC places on its TR and associate units.

¹⁰ TR units typically meet on the same weekend each month unless it coincides with a federal holiday.

¹¹ IMAs have flexibility to coordinate a schedule agreeable with their active duty supervisor. While ARC members work at a variety of companies doing business with USG, existing conflict of interest practices would be used.

¹² Not all AFSCs have Initial and Mission Qualification Training (IQT and MQT). As part of its transition to an operational series AFSC (i.e., an officer or enlisted AFSC that starts with a 1) versus a

flexible enough to allow the unit and its customers to adapt, yet provide structure and accountability. Over time, increased granularity in governing AFIs would be expected as the units mature. Given that personnel would be assigned to the unit based on their reputation for being an expert in one or more fields, there should be no formal MQT.¹³ On the job training (OJT) is expected and may incorporate AF or commercial courses.

Based on available unclassified information, three viable areas stand out as possible uses for implementation teams to consider: red teaming acquisition documents, reviewing Operations Plans (O-Plans) for cyber requirements, and analyzing cyber dependences of the Core Function Master Plans (CFMPs).¹⁴ An ARC team could develop expertise in red teaming the cyber-related content of documents associated with the acquisition life cycle process. The functional orientation of a CESET unit would allow leadership to best match its expertise with the wide range of needs throughout the acquisition community, vice assigning them to a particular organization. The administrative flexibility enables the unit's superior commander an option to view the CESET as a combat arms commander views a reserve, ready to respond to the highest priority needs. Another ARC team could develop expertise in mapping O-Plan dependence on cyber requirements. Former CJCS Admiral Mullen tasked the CCMDs to accomplish this. Another ARC team could analyze the USAF's thirteen CFMPs for their dependence on cyber capabilities. This task requires a top down approach to identify critical vulnerabilities.¹⁵

Virtual Teaming

Contemporary technology has enabled virtual teams to accomplish tasks independent of time and space.¹⁶ While the type of facility used varies based in part on the security requirements, the ARC should use virtual teaming (VT) to increase mission effectiveness and efficiency. The effectiveness could be increased by allowing the best ARC Airmen to work a short term project

support AFSC (i.e., an AFSC that starts with a 3), the cyber community has adopted other operations approaches. The initial Cyber qualification course name changed from Basic Communication Officer Training (BCOT) to Undergraduate Cyber Training (UCT), based on the rated Undergraduate Pilot Training (UPT) course. After AF Space Command (AFSPC) took responsibility for AF Cyber and 24th NAF, the cyber community created courses modeled on the Space 100, 200 and 300 sequence paradigm. While the AF does offer Cyber 200 and 300, Cyber 100 does not exist.}

¹³The standard requirements for upgrade training and AFSC qualification apply.

¹⁴ Red teaming is a tactic of viewing a problem the adversaries' perspective.

¹⁵ Conversation with Dr. Jabbour, Mar 2013. Remotely Piloted Vehicles (RPAs) are a common example of the need for mission assurance.

¹⁶ “Communication and information technologies have long been deeply intertwined into most aspects of work. However, technology breakthroughs—especially mobile technologies and the Internet—are enabling work to be separated with respect to time and space. This separation is prompting the rethinking of work and how and where it is performed.” Given the scope of the report, RAND appropriately did not further expand on the necessary ‘rethinking’ (**RAND TR637**) The

or even be assigned to a unit because they have specific expertise, independent of geography. Since the mid-1990s, the Joint Reserve Intelligence Program (JRIP) has expanded the number of available sites at which Reserve forces can accomplish classified mission sets (including several cyber mission sets). The unit commander should have authority to use virtual teaming based on unit needs.¹⁷ This initiative reduces total costs in both time and expense for both the member and the USAF. .

While the time required for relaying information has dramatically reduced in recent decades, geographically dispersed teams are nothing new. From the legendary Greek runner who witnessed the Persian defeat at the battle of Marathon to the use of radios for Allied planning in the Pacific theater in WWII, military members have collaborated over long distances.

Compared to current technology, the OSS's virtual teaming was primitive.^{18,19} The geographically dispersed teams and headquarters units relied on telephone and mail delivery. In addition to the innovative Research and Analysis (R&A) division and operations support positions both in theater and Washington DC, the government has created additional methods to meet its analytic needs, including Federally Funded Research and Development Centers (FFRDCs) and contracts with academic institutions. While technological limitations were a partial motivator, the OSS found that forward deployed analytic and operational support personnel were beneficial, a practice still used today.

The cyber enterprise presents opportunities for the ARC to demonstrate its capability to contribute to the national defense. While there are no silver bullets, the Reserve Component has the opportunity to leverage the expertise of its Airmen to contribute to the AF cyber enterprise. Unlike the many military missions that must deploy to actively participate, many cyber missions can be accomplished in the CONUS through well thought and well organized organizational constructs.²⁰

¹⁷ Impacts of formal reporting need to be considered to reduce the unintended consequences of virtual teaming being under or over used, simply to meet arbitrary goals.

¹⁸ The CRAF program provides transportation of people and cargo; while the management and administrative actions required to run an airline and coordinate with the USAF, particularly Air Mobility Command (AMC), benefited from technological advances, there was no mention in the literature of CRAF or airline specific virtual teaming innovations.

¹⁹ The three eras Toffler described in his book *The Third Wave* are agricultural, industrial and post-industrial (which others refer to as information, 1950 - present).

²⁰ The deterrence aspect of military power is addressed elsewhere. See Robert Pape's *Bombing to Win: Air Power and Coercion in War*.

Chapter 7

Conclusion

The future is already here — it's just not very evenly distributed.

William Gibson

The current Reserve Component (RC) provides operational capability and strategic depth across a wide variety of combat, combat support and support functions. This thesis focused on the nexus of the maturing field of cyberspace and the long tradition of the civilian soldier (and recently Airman). The fundamental research question for this study was – How should the AF best leverage part-time Citizen Airmen’s civilian expertise to contribute to the USAF cyber mission? There are opportunities to increase cyber mission effectiveness by selectively leveraging the expertise some Airmen gain and use during their civilian employment.

The introductory chapter included a discussion of the strengths and weaknesses of historical analogy. It leveraged the ideas from a variety of specialties – history, international relations and science fiction. The premise is that a historical analogy “signifies an inference that if two or more events separated in time agree in one respect, then they may also agree in another.”¹ This study also heeded the warning of Scot MacDonald and Robert Jervis. MacDonald’s discernment that “without historical analogies, every foreign policy crisis would appear to be unique,”² and Jervis’ “patterns and causal links [to] help in understanding his world,”³ were important in crafting the overall research design. This research applied lessons learned from previous experiences, combined with a realistic understanding of the unique challenges of the current cyber enterprise, to offer thoughtful possibilities for approachable solutions.

The second chapter provided the necessary background in the history of military policy and cyberspace. The first section described the three significant milestones in the history of the national military policy debate and its impact on current events. The two laws (Militia Acts of 1792 and 1903) and DOD policy on Total Force set the current trajectory of Reserve Component contributions. The second half describes an approach to thinking about cyberspace that will highlight the similarities and unique challenges the DOD is facing compared to the four physical domains. While there are many ongoing practices within the cyber environment that have been

¹ Khong, *Analogy at War*, 6–7.

² Quoted in Sheldon, “Reasoning by Strategic Analogy: Classical Strategic Thought and the Foundations of a Theory of Space Power,” 19.

³ Jervis, *Perception and Misperception in International Politics*, 217.

borrowed from the other four domains, there are opportunities for the active component (AC) and RC to leverage the uniqueness of the cyber domain.

The two historic analogies were described in Chapters Three and Four. The Office of Strategic Services (OSS) and Civil Reserve Air Fleet (CRAF) were two distinct solutions the USG created to satisfying gaps in its AC. During its short, nearly four-year existence from 1941 until 1945, the Coordinator of Information (COI) and OSS were the USG's first formal civilian organization and military unit, respectively, authorized to accomplish sabotage and centralized intelligence. Chapter Four described the Civil Reserve Air Fleet (CRAF) program, a contract that enables the USAF to meet some of its wartime and peacetime airlift requirements through US commercial carrier capabilities. When the Joint Chiefs of Staff (JCS) worked with the President to make the OSS a direct reporting agency, they gained complementary capabilities to conventional Army units.⁴ For over sixty years the CRAF program continues to provide a capability that satisfies the DOD surge airlift requirements and simultaneously provides acceptable profit for the assumed risk.

The fifth chapter analyzed the Air Reserve Component's (ARC's) contribution to the cyber enterprise through the lenses of culture, cost and risk. As each of the three key variables was discussed, the relevant examples from the two historic analogies were highlighted and then applied to the ARC cyber enterprise. Given the breadth of ongoing policy initiatives including pay and benefits, operational force, and force mix, this chapter focused on data relevant for the specific recommendations offered in the following chapter.

The sixth chapter provided three recommendations the Air Force Reserve Command (AFRC) and Air National Guard (ANG) leadership can implement to improve the ARC contribution to the cyber mission. Each of the three recommendations can be implemented at a different level (ARC, unit and individual). First, the DOD needs to clarify its policy for the RC role in the CONUS based cyberspace mission and fund it appropriately. This recommendation acknowledges that the CONUS cyber mission is unique compared to the typical deployed combat and combat support missions. Second, the ARC should create elite teams that supported combatant commands (CCMDs) and Homeland Defense Civil Support (HDCS) units can use to experiment with organizational response approaches. Third, ARC Airmen should utilize virtual teaming (VT) and telecommuting to contribute to the fight regardless of geographic limitations. These recommendations are intended to build upon the existing and planned direction for some units within the ARC cyber enterprise.

⁴ While its name has remained the same since its creation, the Goldwater-Nichols Act of 1986 established the current roles of the JCS and its Chairman.

Points for further study

This research was intended to make a persuasive argument to ANG and AFRC leadership that there are additional ways their Airmen can contribute to the cyber enterprise. As a result, this paper did not provide a detailed implementation plan for any of the three recommendations. Additional research should be accomplished to understand the interaction of each of the three recommendations with the current policy changes being discussed at the Pentagon and in Congress including pay and benefits, operational force and force mix.

Chapter Two presented three alternative external forces applicable to RC usage that should be further explored. While this research focused on military policy, detailed analysis into (1) the economics of the militia and reserve components; (2) laws about active and reserve federal military forces and National Guard; and (3) the motivations of elected officials, would help the ARC better understand the historical and contemporary context of its employment. Attention should be given to understanding the impact of the Uniformed Services Employment and Reemployment Rights Act (USERRA) on the various types of Reservists' employers and the unique role of the self-employed RC members.

The current establishment of a single standard, especially in cyberspace AFSCs, for all Airmen in the AC, Reserve and ANG, needs to be studied, so ARC leaders can make informed decisions about the benefits and limitations. The following questions would help potential and current Airmen get clarity into the vision for the ARC's contribution to the cyber environment. Does the ARC want to recruit personnel who have deep technical cyber skills? What role should those with complementary skills like technology-focused venture capitalists have? If those RC-exclusive skills are desired, how are the officers tracked in the personnel systems? The current six-month training requirement for cyberspace operations officers (17D1) is one limitation that should be better understood.

The human resource management (HCM) aspects of cyber also need additional research. Many HCM systems fail to provide adequate support for commanders' and planners' needs to capture and retrieve Airmen's cyberspace skills. While it is challenging enough to capture and implement current requirements, it is even more challenging and important to create a culture and systems with flexibility to respond to the changes in cyber environment.

Ultimately, this research has shown that the experience, skills and talent of today's citizen Reserve and Guard Airmen are an incredible force multiplier in today's ongoing cyber

enterprise. Optimizing the leveraging of that talent is no easy task. However, a concentration on the impact of cost, risk and culture, and a deeper understanding of successful past examples in other areas, will provide guidance to decision makers for assembling the most prepared, most professional, and most coherent Air Force team.

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